



MONTANA FISH, WILDLIFE AND PARKS ADMIN BLDG, MAINT. BLDG & HOST PAD

SHEET MAINT. BLDG
FOUNDATION
AND ROOF
FRAMING ADD
ALT. 1

DRAWN:	KBH
CHECKED:	KBH
DATE:	03/18/15
JOB#:	131212

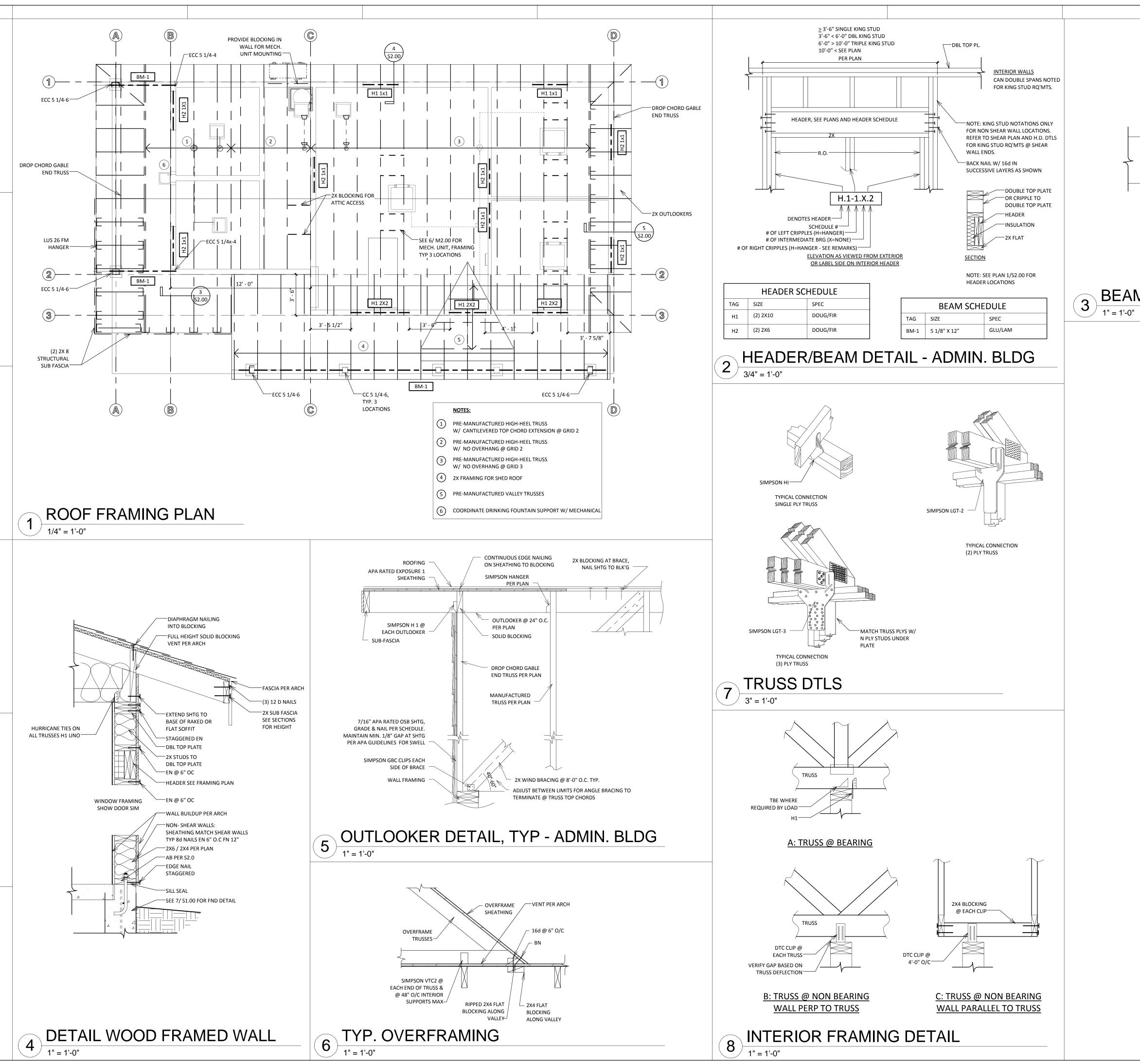
\$1.10

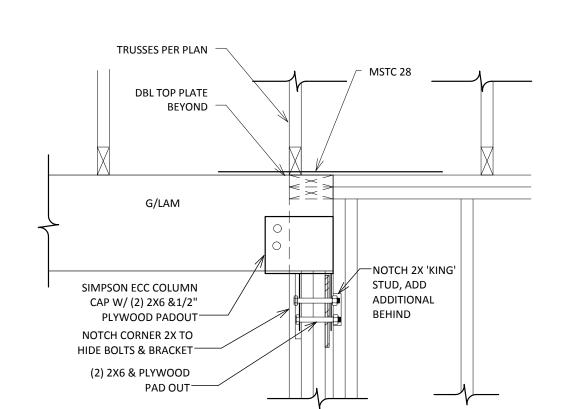
SHEET 21 OF 31

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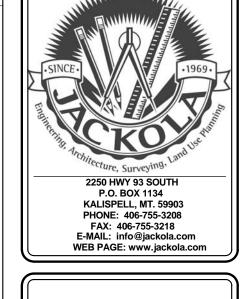
7 ROOF FRAMING PLAN - MAINT. BLDG

1/4" = 1'-0"





BEAM DETAIL





MONTANA FISH, WILDLIFE AND PARKS ADMIN BLDG, MAINT. BLDG & HOST PAD

SHEET

ADMIN BLDG

ROOF FRAMING

PLAN

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REVISIONS:

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\$2.00

SHEET 22 OF 31

WITHOUT THE WRITTEN CONSENT O JACKOLA ENGR. & ARCH., P.C.

292

SUPPLY AIR DIFFUSER

RECTANGULAR DUCTWORK. SIZE INDICATED

ROUND DUCTWORK. DIAMETER

SUPPLY OR OUTSIDE AIR DUCT

90° ELBOW WITH TURNING VANES

RADIUS DUCTWORK ELBOWS ROUND OR

BRANCH TAKE-OFF WITH VOLUME DAMPER

OUTDOOR AIR

EXHAUST AIR

SCHEDULE TAG SYMBOL

TEMPERATURE SENSOR

ROOM PRESSURE MONITOR

HUMIDITY SENSOR

HEAT RECOVERY VENTILATOR CONTROL

FLEXIBLE CONNECTOR

FLOW BALANCING VALVE

VALVE, MODULATING

RELIEF VALVE

₩ VALVE

1/8" STRAINER, WYE TYPE

THERMOMETER

→ CHECK VALVE, SWING

CONTROL VALVE

DRAIN & FILL VALVE W/HOSE

THREE-WAY AUTOMATIC MIXING

THERMOSTATIC MIXING VALVE

CONNECTION (SERVICE)

AUTOMATIC AIR VENT

TWO-WAY FLOW CONTROL

TWO-WAY FLOW CONTROL

PRESSURE REDUCING VALVE

BACKFLOW PREVENTER

AIR SEPARATOR

PRESSURE GAUGE

FLOWMETER - TURBINE

■ WATER HAMMER ARRESTOR

HEAT EXCHANGER

THERMOSTAT

HUMIDISTAT

- DESIGNATION

- AIRFLOW (CFM)

RETURN AIR DUCT

EXHAUST AIR DUCT

RECTANGULAR

DIFFUSER/GRILL LABEL:

GENERAL MECHANICAL NOTES

1. COMPLETE INSTALLATION OF THE MECHANICAL SYSTEM SHALL BE PER THE STATE BUILDING, MECHANICAL ENERGY, FIRE, PLUMBING AND HEALTH CODES, AND REGULATIONS AS ADOPTED BY LOCAL JURISDICTIONS.

2. ALL EQUIPMENT SHALL BE THE CAPACITY AND TYPE AS SHOWN ON THE EQUIPMENT SCHEDULE AND SHALL BE THE LISTED MANUFACTURER AND MODEL NUMBER OR SHALL BE AN EQUAL APPROVED BY THE OWNER/ENGINEER.

3. CONTRACTOR IS TO BRING UP THE DISCREPANCIES AND ITEMS WHICH ARE NOT SPECIFICALLY CALLED FOR OR SHOWN BUT ARE REQUIRED FOR A COMPLETE MECHANICAL SYSTEM. ALL SUCH ITEMS REQUIRED FOR A COMPLETE SYSTEM READY FOR THE OWNER'S BENEFICIAL USE SHALL BE FURNISHED AND INSTALLED INCLUDING ALL SUCH DISCREPANCY ITEMS MENTIONED ABOVE. AT NO ADDITIONAL COST TO THE OWNER AND PER LOCAL CODES, MANUFACTURER'S RECOMMENDATIONS AND APPLICABLE STANDARDS WITH THE ARCHITECT/ENGINEER'S APPROVAL

4. ALL EQUIPMENT SUPPLIED FOR THESE SPECIFICATIONS SHALL BE FREE FROM DEFECTS IN MATERIAL, WORKMANSHIP, AND TITLE, AND SHALL BE OF THE KIND AND QUALITY DESCRIBED HEREIN. IF IT APPEARS WITHIN ONE YEAR FROM DATE OF FINAL ACCEPTANCE THAT EQUIPMENT DOES NOT MEET THE WARRANTIES ABOVE, THE CONTRACTOR SHALL IMMEDIATELY CORRECT ANY DEFECT AND SHALL RESTORE THE SYSTEM TO THE ORIGINAL SATISFACTORY CONDITIONS AT HIS EXPENSE. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF OTHER WARRANTIES, WHETHER WRITTEN, ORAL, IMPLIED, OR STATUTORY. NO WARRANTY OR MERCHANT ABILITY OF FITNESS FOR PURPOSE SHALL APPLY (THE WARRANTY SHALL START FROM THE TIME OF ARCHITECT/ENGINEER'S FINAL ACCEPTANCE).

5. ENTIRE INSTALLATION OF ALL EQUIPMENT, CONTROL, PIPING, DUCTWORK, AND RELATED ACCESSORIES SHALL BE PER BASIC OWNER'S STANDARDS. MECHANICAL CONTRACTOR IS TO FAMILIARIZE HIMSELF WITH THESE STANDARDS.

6. MECHANICAL CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ROUTING AND INTALLATION FEASABILITY OF ALL EQUIPMENT, PIPING, AND DUCTWORK, AND INCLUDE IN HIS BID ADDITIONAL PIPING, DUCTWORK, FITTINGS, OFFSETS, ETC. WHICH MIGHT BE REQUIRED FOR A COMPLETE SYSTEM READY FOR OWNER'S BENEFICIAL USE.

7. COORDINATE THE CONSTRUCTION SCHEDULE WITH THE GC AND PERFORM ALL REQUIRED WORK IN STRICT ACCORDANCE WITH THE OWNER'S SCHEDULE.

8. MECHANICAL CONTRACTOR SHALL PAY FOR AND OBTAIN ALL REQUIRED PERMITS AND CERTIFICATES REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.

EQUP EQUIPMENT

ER EXHAUST REGISTER

ERV ENERGY RECOVERY VENTILATOR

A. PROVIDE FLEXIBLE CONNECTION IN ALL DUCTS CONNECTING TO AIR MOVING EQUIPMENT AS CLOSE TO FAN AS POSSIBLE. FLEXIBLE CONNECTION SHALL CONSIST OF 6" OR MORE OF AIR TIGHT, FIRE PROOF FLEXIBLE NEOPRENE COATED WOVEN FIBROUS GLASS MATERIAL. VENT FABRICS, INC. OR APPROVED EQUAL.

B. ALL DUCTWORK SHALL BE SHEET METAL C. ALL SUPPLY & RETURN FLEXIBLE DUCTS SHALL BE CONSTRUCTED OF DOUBLE LAMINATION OF POLYESTER ENCAPSULATED STEEL WIRE HELIX FOR INNER CORE HIGH DENSITY FIBERGLASS INSULATION AND GRAY POLYESTER FILM WITH SPIRAL REINFORCEMENTS, EQUAL TO ATCO-70 SERIES (MIN. POS. PRESS. = 6' W.G. NEG. PRESS. = 0.75" W.C.

D. SEAL ALL DUCTWORK JOINTS WITH TUFF-BOND #12 SEALER AND DURO-DYNE TYPE FT-2 TAPE OR EQUAL. E. ALL EQUIPMENT, DUCTWORK AND PIPING SHALL BE STRUCTURALLY SUPPORTED AND SECURELY FASTENED TO BUILDING STRUCTURE IN AN ACCEPTABLE MANNER TO OWNER, ARCHITECT, ENGINEER AND LOCAL JURISDICTION AND SHALL BE

SEISMICALLY BRACED PER THE SMACNA AND/OR REQUIRED BY LOCAL JURISDICTIONS. F. PROVIDE LOCKABLE VOLUME DAMPERS IN ALL AIR DISTRIBUTION OUTLETS.

G. DUCT HANGERS, SUPPORTS AND METHODS OF INSTALLATION SHALL CONFORM TO ASHRAE & SMACNA RECOMMENDATIONS. H. <u>DUCT SIZES SHOWN ON PLANS INDICATE INSIDE FREE AREA</u>.

I. ALL DUCTWORK SHALL BE CLASS-1 AIR DUCT AS APPROVED BY U.L.-181. J. ALL SOUARE ELBOWS SHALL HAVE TURNING VANES

K. OSA DUCTWORK IN UNHEATED SPACES AND SUPPLY AIR IN ANY SPACE SHALL HAVE INSULATION WITH VAPOR BARRIER JACKET WITH MINIMUM THERMAL RESISTANCE VALUE OF "R-7". INTERIOR SOUNDLINING WITH MINIMUM "R-7" SATISFIES THE INSULATION REQUIREMENT WHICH MAY BE USED IN LIEU OF EXTERIOR INSULATION.

10. ALL FIRE RATED STRUCTURE SHALL BE FIRE DAMPERED AS REQUIRED BY THE JURISDICTION.

11. FLEXIBLE DUCTS SHALL HAVE MAXIMUM 6 FEET LENGTH UNLESS SHOWN OTHERWISE AND SHALL NOT PENETRATE THROUGH ANY FIRE RATED WALLS. DO NOT INSTALL FLEXIBLE DUCTS WITHIN 6 FEET OF HEATING ELEMENT.

12. TESTING: REFRIGERATION PIPING SHALL BE TESTED UNDER PRESSURE AND PROVEN TO BE LEAK FREE. HVAC SYSTEM SHALL BE STARTED UP, BALANCED TO DESIGN SPECIFICATIONS, AND OPERATED IN BOTH HEATING AND COOLING MODES. REFRIGERATION SYSTEM SHALL BE STARTED UP AND BROUGHT DOWN TO DESIGN TEMPERATURE.

13. MECHANICAL, HVAC, AND PLUMBING ELEMENTS SHALL AT NO TIME COME IN CONTACT WITH CEILING CONSTRUCTION EXCEPT AS NECESSARY PENETRATIONS MAY REQUIRE.

14. ACCESS SHALL BE PROVIDED BY GC AS REQUIRED FOR INSTALLATION AND MAINTENANCE OF MECHANICAL, ELECTRICAL, AND OTHER ELEMENTS WITHIN CEILING SPACE AND AS REQUIRED BY CODE. LOCATIONS FOR SPECIAL ACCESS DOORS, HATCHES, ETC. SHALL BE COORDINATED WITH OTHER TRADES.

16. SHOP DRAWINGS FOR ALL RELATED TRADES (PLUMBING, SPRINKLER, HVAC) SHALL BE SUBMITTED FOR REVIEW/APPROVAL PRIOR TO MANUFACTURING AND INSTALLATION.

17. ALL HVAC ELEMENTS SHALL MATCH ADJACENT WALL OR CEILING FINISH COLOR, INSTALLED FLUSH AND TRUE AND CENTERED WITHIN THE CEILING GRID. LOCATIONS SHALL BE PER APPROVED MECHANICAL PLANS.

18. INSULATION OF COLD WATER LINES SHALL BY PROVIDED TO PREVENT CONDENSATION DAMAGE AND IN OBSERVANCE OF ENERGY CONSERVATION PRACTICES, HOT WATER HEATING LINES SHALL BE INSULATED - SEE SPECIFICATIONS.

19. THERMOSTATS SHALL BE MOUNTED AT 4'-0" A.F.F. LOCATIONS PER MECHANICAL PLAN AND TO BE COORDINATED BY GC WITH OTHER

TRADES AND APPROVED BY BUILDING MANAGEMENT REPRESENTATIVE AND ARCHITECT. MOUNT TO ALIGN VERTICALLY WITH LIGHT 20. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO THE OWNER AT JOB

COMPLETION. ALL PRODUCT WARRANTY REGISTRATION CARDS, APPLICATIONS, AND CERTIFICATES SHALL BE COMPLETED AND TURNED OVER TO THE OWNER.

WATER GAUGE

WMS WIRE MESH SIZE

WT WEIGHT

MECHANICAL ABBREVIATIONS

ABV	ABOVE	ESP	EXTERNAL STATIC PRESSURE	NIC	NOT IN CONTRACT
AC	ALTERNATING CURRENT	ET ET	EXISTING AIR TERMINAL	NO.	NUMBER
AD	ACCESS DOOR, AUTOMATIC DAMPER	EWT	ENTERING WATER TEMPERATURE	NTS	NOT TO SCALE
AFF	ABOVE FINISHED FLOOR	EXIST	EXISTING	O/A	OUTDOOR AIR
AHU	AIR HANDLING UNIT	F	DEGREES FAHRENHEIT	OC	ON CENTER
ASL	ACOUSTICAL LINING	FC	FLEXIBLE CONNECTOR	OD	OUTER DIAMETER
AMP	AMPERE	FD	FIRE DAMPER	OPNG	OPENING
	APPROXIMATE OR APPROXIMATELY	FIN	FINISH OR FINISHED	PCF	POUNDS PER CUBIC FOOT
ARCH.	ARCHITECT OR ARCHITECTURAL	FL	FLOOR	PF	POWER FACTOR
AUTO	AUTOMATIC	FLEX	FLEXIBLE		PHASE (ELECTRICAL)
BE	BOTTOM ELEVATION	FOB	FLAT ON BOTTOM	PRESS.	PRESSURE
BHP	BRAKE HORSEPOWER	FOT	FLAT ON TOP	PSI	POUNDS PER SQUARE INCH
BLDG	BUILDING	FPM	FEET PER MINUTE	R/A	RETURN AIR
BOD	BOTTOM OF DUCT	FT	FOOT OR FEET	REQD.	REQUIRED
BOG	BOTTOM OF GRILLE	FWE	FURNISH WITH EQUIPMENT	RG	RETURN GRILLE
BTU	BRITISH THERMAL UNIT	GA	GAUGE	RR	RETURN AIR REGISTER
BTUH	BRITISH THERMAL UNIT PER HOUR	GAL	GALLON	RH	RELATIVE HUMIDITY
CC	COOLING COIL	GPM	GALLONS PER MINUTE	RPM	REVOLUTIONS PER MINUTE
CD	CEILING DIFFUSER	HC	HEATING COIL	S/A	SUPPLY AIR
CEIL	CEILING	HOR	HORIZONTAL	SF	SERVICE FACTOR
CFM	CUBIC FEET PER MINUTE	HP	HEAT PUMP OR HORSEPOWER	SP	STATIC PRESSURE
CL	CENTER LINE	HR	HOUR	SPEC	SPECIFICATIONS
СО	CARBON MONOXIDE	HRV	HEAT RECOVERY VENTILATOR	STD	STANDARD
CO2	CARBON DIOXIDE	HVAC	HEATING, VENTILATING, AND AIR	SVK	SOLENOID VALVE KIT
CR	CEILING REGISTER		CONDITIONING	TAB	TESTING, ADJUSTING, AND
CP	CIRCULATION PUMP	HZ	ALTERNATING CURRENT FREQUENCY		BALANCING
DB	DRY BULB	I.D.	INSIDE DIAMETER	TEMP	TEMPERATURE
DC	DIRECT CURRENT	IN.	INCH	TG	TRANSFER GRILLE
DIA	DIAMETER	IN H2O	INCHES OF WATER COLUMN	TOD	TOP OF DUCT
DN	DOWN	INSUL	INSULATE OR INSULATION	TOG	TOP OF GRILLE
DPR	DAMPER	KW	KILOWATT	TSP	TOTAL STATIC PRESSURE
DWG	DRAWING	KWH	KILOWATT-HOUR	TYP	TYPICAL
DX	DIRECT EXCHANGE	LAT	LEAVING AIR TEMPERATURE	V	VOLT
E/A	EXHAUST AIR	LB	POUND	VEL	VELOCITY
EA	EACH	LIN	LINEAR	VENT	VENT, VENTILATE, VENTILATIN
EAT	ENTERING AIR TEMPERATURE	LVG.	LEAVING		OR VENTILATION
EL	ELEVATION	LWT	LEAVING WATER TEMPERATURE	VFD	VARIABLE FREQUENCY DRIVE
ELEV	ELEVATOR	MAN.	MANUAL	VOL	VOLUME
ELEC	ELECTRIC OR ELECTRICAL	MAX	MAXIMUM	W	WATT
ENT	ENTERING	MD	MANUAL DAMPER	WB	WET BULB

MECH MECHANICAL

NC NORMALLY CLOSED

MIN MINIMUM

CODE COMPLIANCE

BUILDING MECHANICAL SYSTEMS ARE DESIGNED IN ACCORDANCE WITH THE FOLLOWING CODES:

- 2012 INTERNATIONAL MECHANICAL CODE
- 2012 UNIFORM PLUMBING CODE
- 2012 IECC INTERNATIONAL ENERGY CONSERVATION CODE ANSI/ASHRAE/IESNA STANDARD 90.1-2010 ENERGY STANDARD
- FOR BUILDINGS EXCEPT FOR LOW-RISE RESIDENTIAL BUILDINGS ANSI/ASHRAE STANDARD 62.1-2010 VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY

HVAC DESIGN CRITERIA

ANNUAL DE	SIGN CONDITIONS: ASHRAE FUNDAMENTALS 2005
WENTHER C	TATION - KALISPELL, MT WMO# 727790
	2966' LAT: 48.28N LONG: 114.27W
WINTER:	
SUMMER:	` ,
	62.3 WET BULB (0.4%)
INDOOR DES	SIGN CONDITIONS:
WINTER:	70 ± 2º F

CONTROL SEQUENCE

CONTROL SEQUENCE OF OPERATION

1. HVAC SYSTEM CONTROL SEQUENCES

MINI-SPLIT HEAT PUMP/AC SYSTEM CONTROL: EACH COMPACT CASSETTE ZONE (OFFICES, COMMON SPACE) SHALL BE CONTROLLED BY A USER ADJUSTABLE THERMOSTAT TO PROVIDE HEATING OR COOLING TO MAINTAIN THE SETPOINT

> OCCUPIED SETTINGS: M-F, 7:00AM - 6:00PM, HEATING: 68°F, COOLING: 75°F. UNOCCUPIED SETTINGS: HEATING: 65°F, COOLING: 80°F.

VENTILATION AIR CONTROL: EACH COMPACT CASSETTE SHALL INCLUDE A FRESH AIR KIT THAT IS CONNECTED TO A COMMON OSA DUCT AND DAMPER. DURING OCCUPIED PERIODS AND WHEN THE OSA TEMPERATURE IS 32°F OR ABOVE,

EXHAUST FAN EF-3,EF-4 CONTROL: THESE EXHAUST FANS SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS TO

EXHAUST FAN/LIGHT/HEATER EF-1, EF-2 CONTROL: FAN AND LIGHT SHALL BE SWITCHED WITH WALL MOUNTED OCCUPANCY SWITCH AND SHALL RUN FOR 10 MINS AFTER SPACE IS EMPTY. EACH HEATER SHALL BE ENGAGED BASED ON SPACE TEMPERATURE. A WALL MOUNTED TEMPERATURE SENSOR IN EACH SPACE SHALL BE CONNECTED TO A REMOTE THERMOSTAT LOCATED IN THE MECHANICAL ROOM. TEMPERATURE SHALL BE SET TO 68°F.

<u>ELECTRIC BASEBOARD HEATER CONTROL:</u> ELECTRIC BASEBOARDS IN OFFICES AND COMMON AREA ARE TO PROVIDE BACKUP HEAT TO SPACE AND SHALL BE SET TO 60°F. THERMOSTATS ARE MOUNTED ON EACH BASEBOARD. BASEBOARD IN MECHANICAL ROOM SHALL BE SET TO 65°F.

					COMPACT CAS	SETTE SCHEDUL	.E						
		BASIS OF DESIG	iN				COOLING	HEATING	5150 5 01011				
							CAPACITY	CAPACITY	ELECTRICAL			WEIGHT	
TAG	DESCRIPTION	MANUFACTURER	MODEL	AREA SERVED	OSA (CFM)	FAN SPEED	(BTU/HR)	(BTU/HR)	DATA V/Ø/Hz	MOP	FLA	(LBS)	NOTES
:C-1	COMPACT CASSETTE	FUJITSU GENERAL LIMITED	AUU12RLF	COMMON AREA 101	30	MED	12000	13500	208-230/1/60	20	0.19	33	1
:C-2	COMPACT CASSETTE	FUJITSU GENERAL LIMITED	AUU7RLF	OFFICE 103	10	LOW	7000	8100	208-230/1/60	15	0.15	33	1
:C-3	COMPACT CASSETTE	FUJITSU GENERAL LIMITED	AUU7RLF	OFFICE 102	10	LOW	7000	8100	208-230/1/60	15	0.15	33	1

1. INCLUDE: GRILLE, WIRED CONTROL T-STAT, AND FRESH AIR KIT.

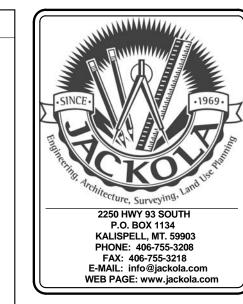
				CONDENSI	NG UNIT / HEA	AT PUMP SCHEDU	ILE							
			BASIS OF DESI	BASIS OF DESIGN		TOTAL								
					NOMINAL	COOLING CAP.	SEER @	TOTAL HEATING		ELECTRICAL DATA			WEIGHT	
TAG	DESCRIPTION	SYSTEM SERVED	MANUFACTURER	MODEL#	SIZE	(MBH)	ARI	CAP. (MBH)	HSPF	V/Ø/Hz	MCA (A)	MOP (A)	(LBS)	NOTES
HP-1	OUTDOOR HEAT PUMP	CC-1; CC-2; CC-3	FUJITSU GENERAL LIMITED	AOU24RLXFZ	2 TON	24	18	24	9.5	208-230/1/60	17	25	124	1

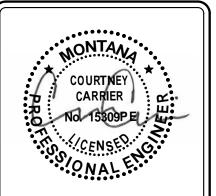
1. INCLUDE WALL MOUNT BRACKETS AND COORDINATE REQUIRED BLOCKING WITH G.C.

				EXHAUST FAI	N SCHEDULE							
		BASIS OF D	BASIS OF DESIGN		DESIGN FLOW		STATIC	ELECTRICAL DATA	MOTOR		WEIGHT	
TAG	DESCRIPTION	MANUFACTURER	MODEL	AREA SERVED	(CFM)	MOTOR HP	PRESSURE	V/Ø/Hz	FLA	MOP	(LBS)	NOTES
EF-1	CEILING MOUNTED EXHAUST FAN; HEATER; LIGHT COMBO	PANASONIC	FV-11VHL2	WOMEN'S RR 105	110	1492 WATTS	.1	120/1/60	12.5	20	22.7	
EF-2	CEILING MOUNTED EXHAUST FAN; HEATER; LIGHT COMBO	PANASONIC	FV-11VHL2	MEN'S RR 106	110	1492 WATTS	.1	120/1/60	12.5	20	22.7	
EF-3	CEILING MOUNTED EXHAUST FAN	PANASONIC	FV-05VQ5	MECH/STORAGE 104	50	11 WATTS	.1	120/1/60	.09	15	10.4	
EF-4	CEILING MOUNTED EXHAUST FAN	PANASONIC	FV-05VQ5	COMMON AREA 101	50	11 WATTS	.1	120/1/60	.09	15	10.4	

		AIR INL	LETS AND OUTLETS SCHE	DULE		
TAG	DESCRIPTION	MANUFACTURER	MODEL	NECK SIZE	BORDER	NOTES
EH-1	STEEL ROOF CAP; EXHAUST	BROAN	634M	6"	ROOF MOUNTED	
EH-2	STEEL ROOF CAP; EXHAUST	BROAN	636	4"	ROOF MOUNTED	
IH-1	STEEL ROOF CAP: INTAKE	BROAN	634M	6"	ROOF MOUNTED	1

1. REMOVE BACKDRAFT DAMPER





PARKS AND MAINT. FISH, MONTANA

SHEET

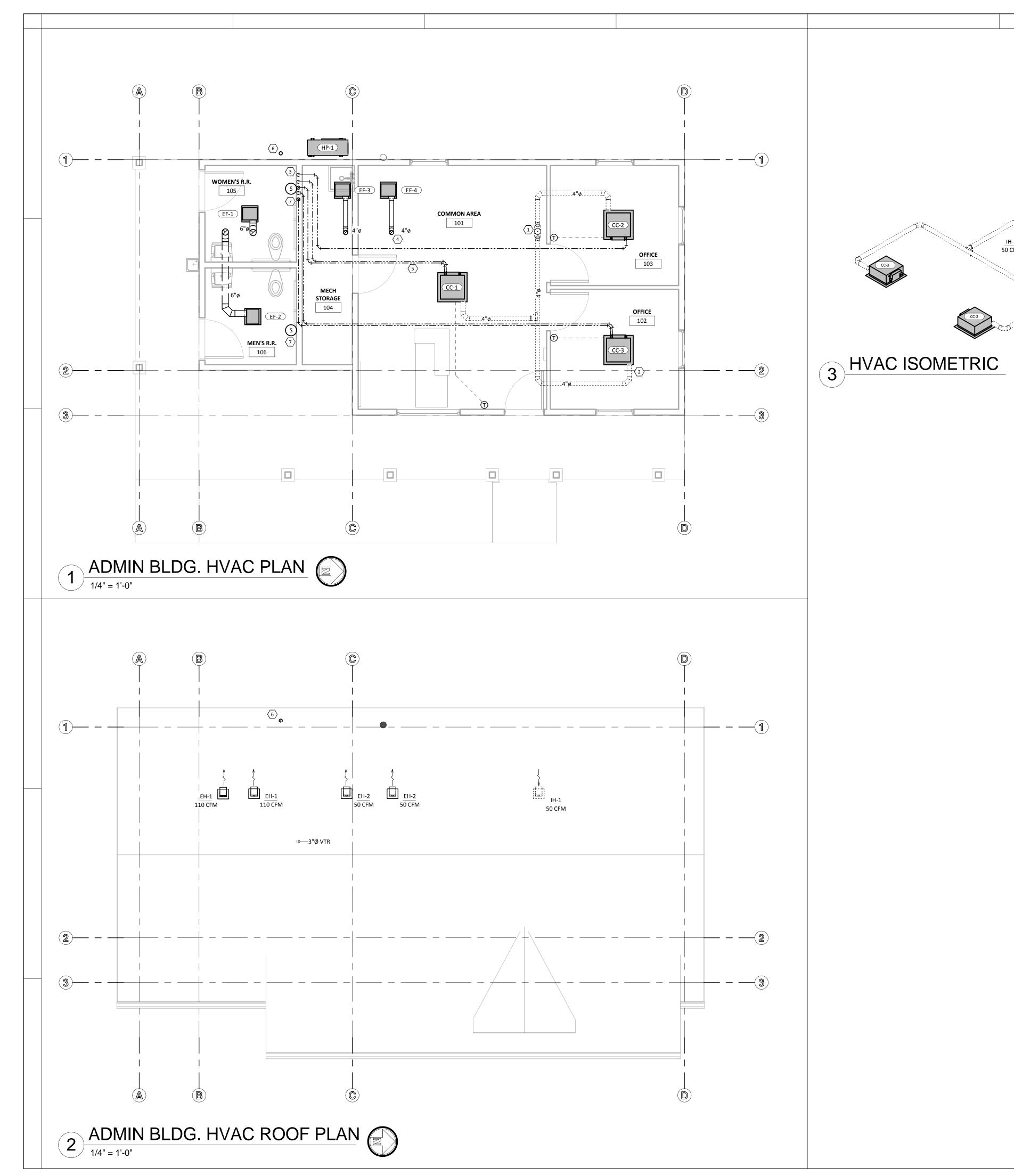
GENERAL NOTES AND SYMBOLS

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SHEET 23 OF 31

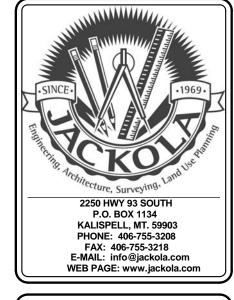
ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED IN THE DRAWINGS





- CONTROL DAMPER ON VERTICAL PART OF 6"Ø OSA DUCT. S CONTROL SEQUENCE FOR OPERATION.
- INCLUDE FRESH AIR KIT FOR COMPACT CASSETTE, TYP.
 CONNECT 4" OSA DUCT. INSULATE OSA DUCT PER SPECS DROP PIPING IN WALL AND ROUTE TO HP-1.
- 6"Ø DUCT RISER TO HOOD MOUNTED ON ROOF, TYP. SEE MECHNICAL ROOF PLAN. REFRIGERANT PIPING TO BE ROUTED ABOVE CEILING TO EACH COMPACT CASSETTE, TYP. SIZE BY MANUFACTURER,
- INSULATE PER SPECS. 4"Ø SCH. 40 PVC RADON PIPE RISER. COORDINATE WITH
- PLUMBING CONTRACTOR FOR EXACT LOCATION. WALL MOUNTED TEMERATURE SENSOR TO CONTROL HEATER/FAN IN CEILING MOUNTED EXHAUST FAN. SEE CONTROL SEQUENCE ON M0.0

EH-2 50 CFM





FISH, WILDLIFE AND PARKS G, MAINT. BLDG, HOST PAD MONTANA [

SHEET

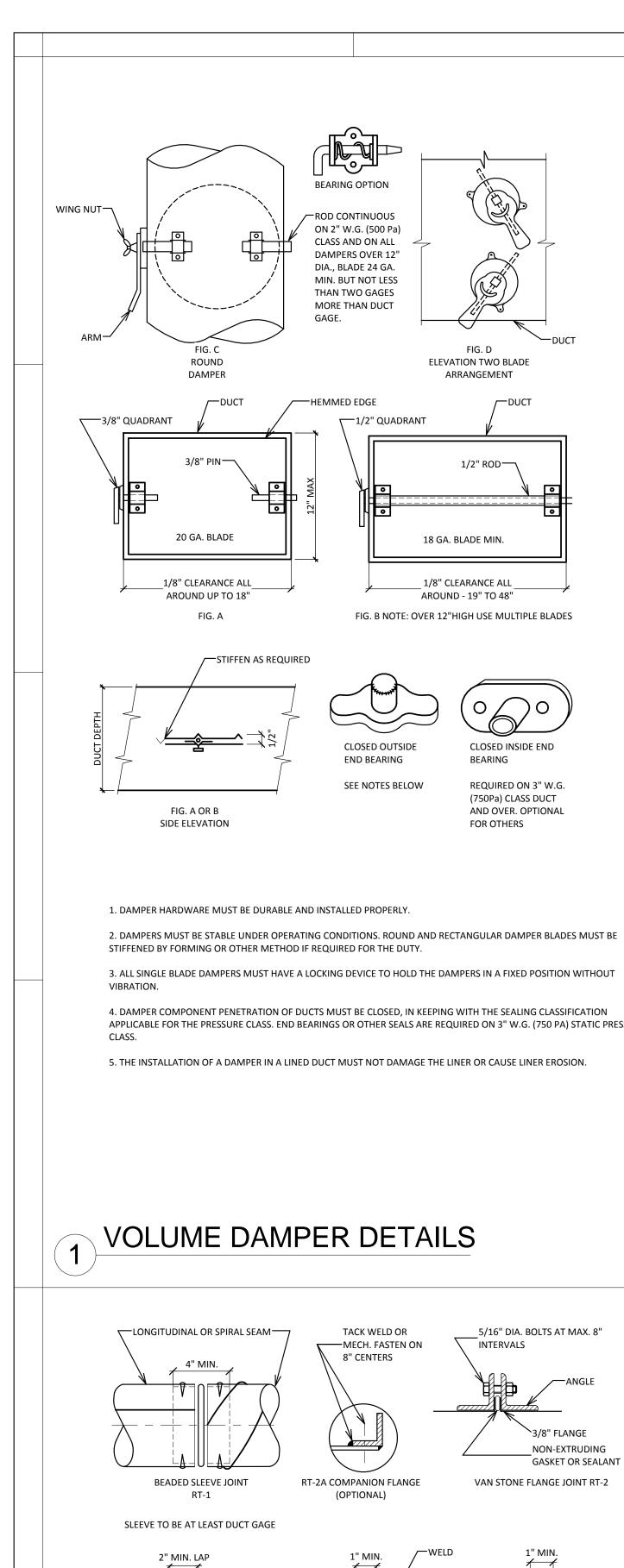
ADMIN BLDG HVAC PLAN

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RT4 OUTSIDE SLEEVE

ROUND DUCT TRAVERSE JOINTS

CRIMP JOINT BEAD OPTIONAL RT-5

LONGITUDINAL OR SPIRAL SEAM DUCT IS ACCEPTABLE FOR ALL JOINTS EXCEPT RT-4 AND 6 (FOR LONGITUDINAL ONLY)

ON JOINTS RT-1,4,5 AND 6 SCREWS MUST BE

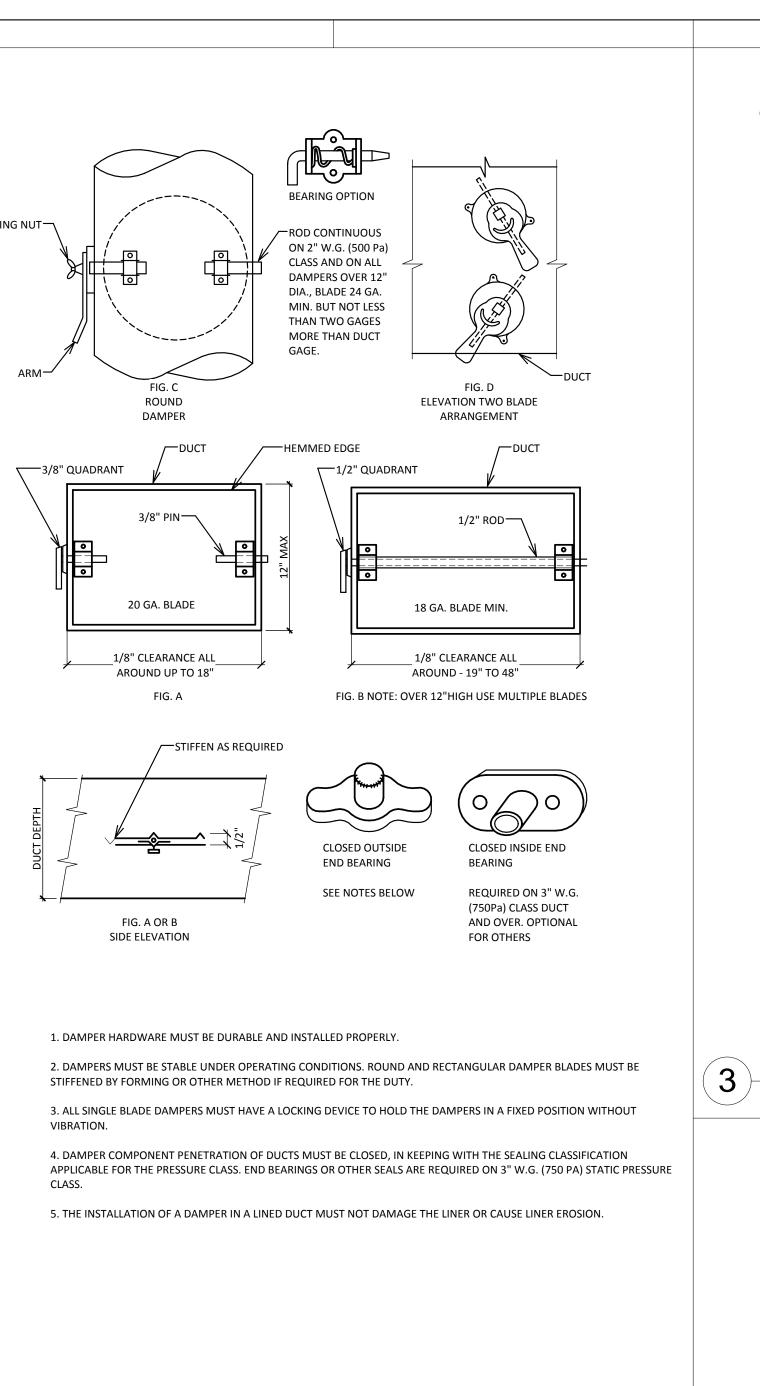
USED AT UNIFORM INTERVALS, 15" MAXIMUM

ALONG THE CIRCUMFERENCE; THREE SCREWS MINIMUM ON 14" OR LESS DIAMETER.

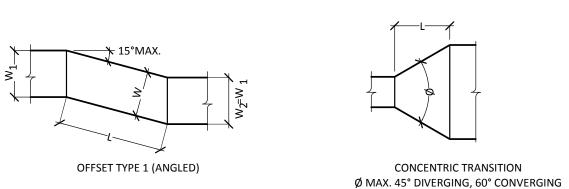
MIN. FLANGE SIZES FOR RT-2 AND 2A, 1"x1"x10 GA. ON 14" MAX. DIA.;

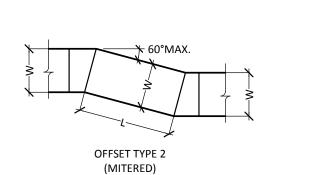
1.5"x1.5"x1/8" DIA. OVER 14"

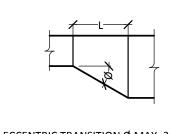
SWEDGE (BELL) RT-8



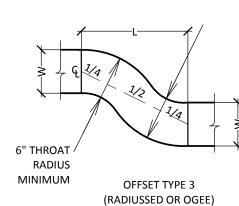
OFFSETS TYPE 2 AND 3 AND TRANSITIONS MAY HAVE EQUAL OR UNEQUAL INLET AND OUTLET AREAS. TRANSITIONS MAY CONVERT DUCT PROFILES TO ANY COMBINATION FOR RECTANGULAR, ROUND OR FLAT OVAL SHAPES.

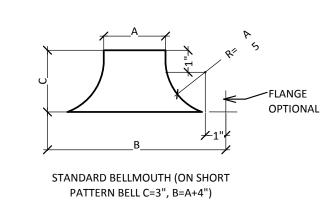




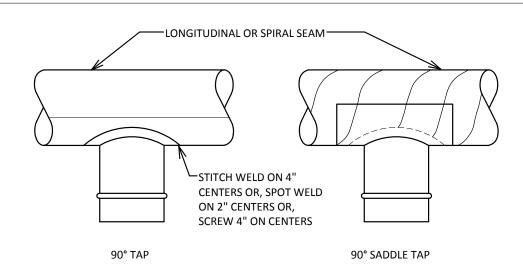


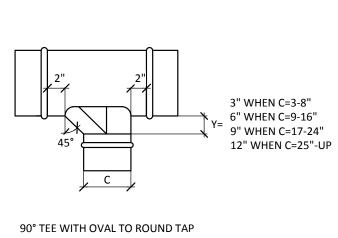
ECCENTRIC TRANSITION Ø MAX. 30°(EXCEPT 45° IS PERMITTED AT ROUND TO FLAT OVAL.)

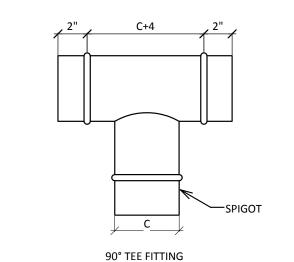




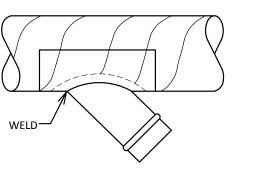
3 DUCT OFFSET AND TRANSITIONS

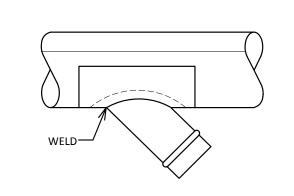




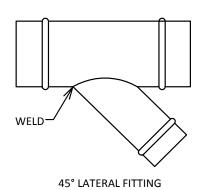


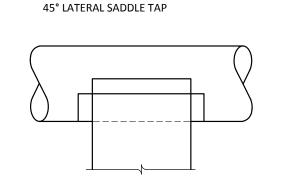






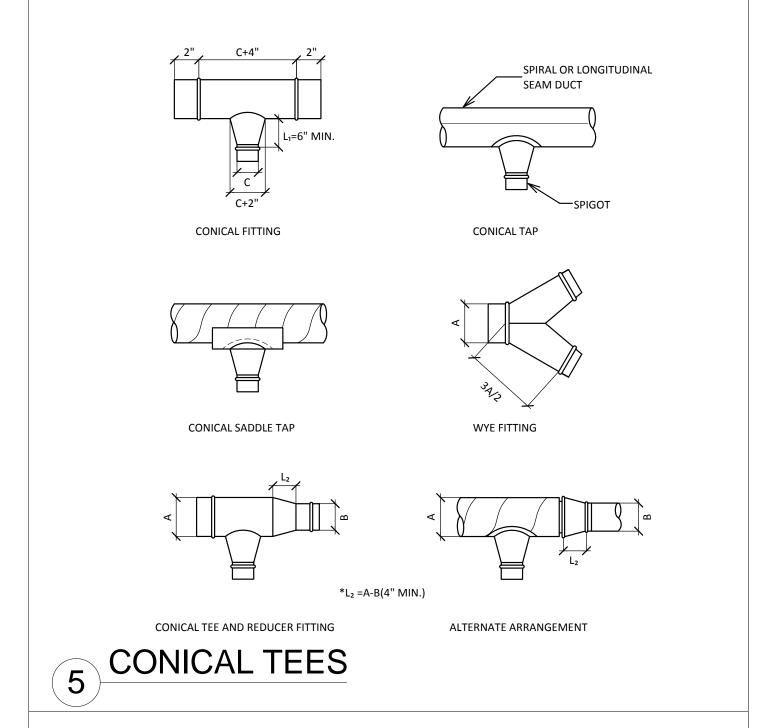
45° LATERAL TAP

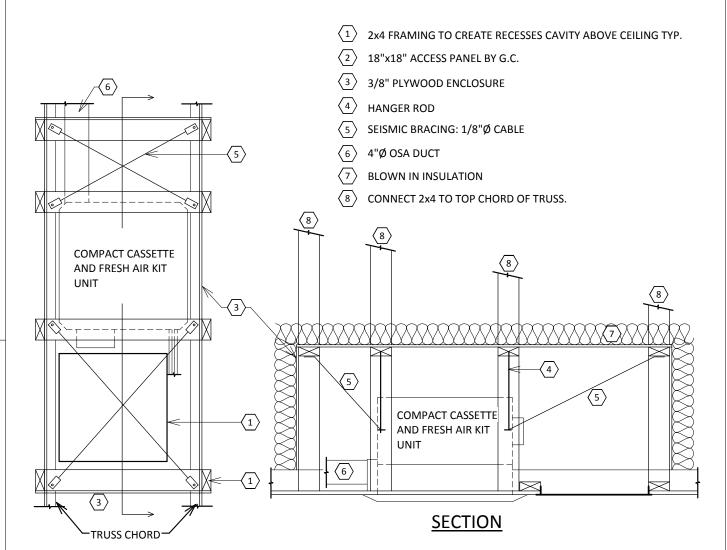




RECT. TAP STRAIGHT OR 45 LEAD IN

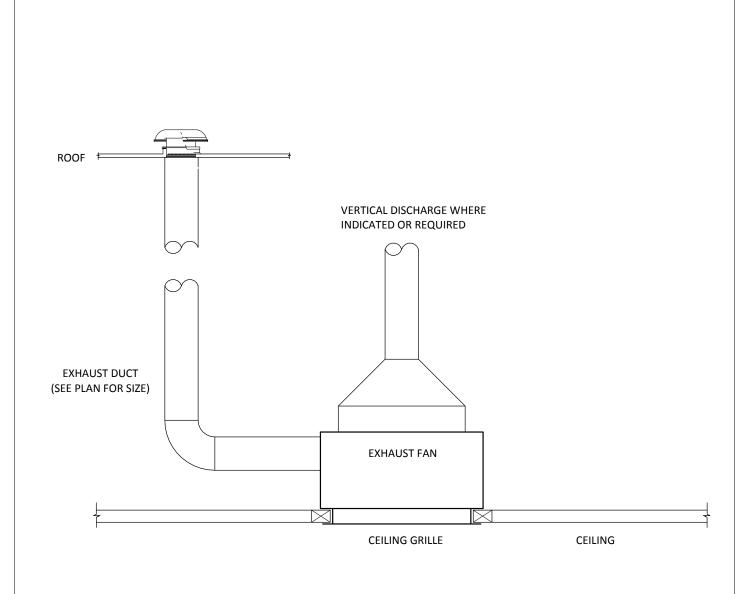
STANDARD SPIGOT LENGTH IS 2".



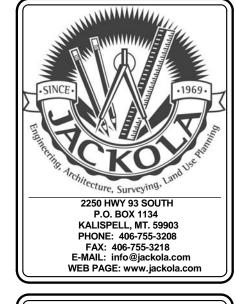


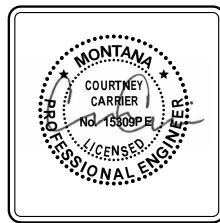
COMPACT CASSETTE MOUNTING DETAIL / 3/4" = 1'-0"

<u>PLAN</u>



7 CEILING MOUNTED EXHAUST FAN 1" = 1'-0"





IND PARKS HOST PAD AND BLDG, WILDLIFE MAINT. FISH, MONTANA ADMIN BLD

SHEET MECHANICAL DETAILS

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GENERAL PLUMBING NOTES:
1. ALL PLUMBING AND PRACTICE TO BE IN ACCORDANCE WITH CURRENT UNIFORM PLUMBING CODE. 2. COMPLETE INSTALLATION OF PLUMBING SYSTEM TO CONFORM TO STATE BUILDING, MECHANICAL ENERGY, FIRE, AND HEALTH CODES, AI REGULATIONS ADOPTED BY LOCAL JURISDICTIONS.
3. MECHANICAL SYSTEMS AS SHOWN ARE SCHEMATIC IN NATURE AND ITEMS NOT SPECIFICALLY CALLED FOR OR SHOWN, BUT REQUIRED FO INSTALLATION FOR THE COMPLETE MECH. SHALL BE PROVIDED, AND ARE REQUIRED AS PART OF THE CONTRACT. MANUFACTURER'S
RECOMMENDATIONS AND INDUSTRY STANDARDS SHALL APPLY. 4. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PLUMBING SYSTEM.
AS INDICATED ON THE DRAWINGS, AS SPECIFIED, AND AS REQUIRED BY CODE. 5. CONTRACTOR RESPONSIBILITY TO VERIFY QUANTITIES.
6. MAINTAIN A MINIMUM OF 6'-0" OF GROUND COVER OVER ALL UNDERGROUND WATER MAINS AND A MINIMUM OF 3'0" OF GROUND COVER OVER ALL UNDERGROUND SEWERS AND DRAINS.
7. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING. 8. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.
9. ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAIN VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS. 10. SUBCONTRACTOR SHALL COORDINATE WITH GENERAL AND VERIFY ALL ROUTING AND SUPPORT SYSTEMS & INCLUDE IN HIS BID ALL
NECESSARY TO PROVIDE THE OWNER WITH A COMPLETE SYSTEM. 11. ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE
PROVIDED AT NO ADDITIONAL COST TO THE OWNER. 12. ALL "OR EQUAL" FIXTURES AND ACCESSORIES TO BE APPROVED BY ARCHITECT OR ENGINEER.
13. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL FIXTURES SHALL BE WHITE. 14. IT IS UNLAWFUL TO CONCEAL CRACKS, HOLES, OR OTHER IMPERFECTIONS IN MATERIALS BY WELDING, BRAZING, OR SOLDERING OR BY
USING THEREIN OR THEREON ANY PAINT, WAX, TAR, OR OTHER LEAK-SEALING OR REPAIR AGENT. 15. BURRED ENDS OF ALL PIPE AND TUBING SHALL BE REAMED TO THE FULL BORE OF THE PIPE.
16. PLUMBING SYSTEMS SHALL BE INSTALLED IN A MANNER CONFORMING TO THE 2009 UPC AND THE MANUFACTURER'S RECOMMENDATIONS. IN INSTANCES WHERE THE CODE AND THE MANUFACTURER'S INSTRUCTIONS CONFLICT, THE MORE STRINGENT
PROVISIONS SHALL PREVAIL. 17. ALL VALVES, PIPES, AND FITTINGS SHALL BE INSTALLED IN CORRECT RELATIONSHIP TO THE DIRECTION OF FLOW.
18. NO PIPING SHALL BE DIRECTLY EMBEDDED IN CONCRETE OR MASONRY. NO STRUCTURAL MEMBER SHALL BE SERIOUSLY WEAKENED OR IMPAIRED BY CUTTING, NOTCHING OR OTHERWISE.
19. PIPING SUBJECT TO UNDUE CORROSION, EROSION, OR MECHANICAL DAMAGE SHALL BE PROTECTED IN AN APPROVED MANNER. 20. NO WATER, SOIL, OR WASTE PIPE SHALL BE INSTALLED OR PERMITTED OUTSIDE A BUILDING OR IN AN EXTERIOR WALL UNLESS, WHERE
NECESSARY, ADEQUATE PROVISION IS MADE TO PROTECT SUCH PIPE FROM FREEZING. 21. ALL PIPE PENETRATING FLOOR/CEILING ASSEMBLIES AND FIRE-RESISTANCE RATED WALLS OR PARTITIONS SHALL BE PROTECTED WITH THE PROPERTY OF THE PLUE PIPE.
REQUIREMENTS OF THE BUILDING CODE. 22. SLEEVES SHALL BE PROVIDED TO PROTECT ALL PIPING THROUGH CONCRETE OR MASONRY EXTERIOR OR BEARING WALLS, AND SHALL BE
SIZED SO THERE IS A MINIMUM 1/2" CLEARANCE AROUND THE PIPE AND/OR INSULATION. 23. PIPING THROUGH CONCRETE OR MASONRY WALLS SHALL NOT BE SUBJECT TO ANY LOAD FROM BUILDING CONSTRUCTION. 24. ALL PIPING SHALL BE SUPPORTED IN SUCH A MANNER AS TO MAINTAIN ITS ALIGNMENT. AND PREVENT SAGGING.
24. ALL PIPING SHALL BE SUPPORTED IN SUCH A MANNER AS TO MAINTAIN TIS ALIGNMENT, AND PREVENT SAGGING. 25. PIPING IN THE GROUND SHALL BE LAID ON A FIRM BED FOR ITS ENTIRE LENGTH. WHERE SUPPORT IS OTHERWISE PROVIDED, IT SHALL BE ACCEPTABLE TO THE ADMINISTRATIVE AUTHORITY.
26. HANGERS AND ANCHORS SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT THE WEIGHT OF THE PIPE AND ITS CONTENTS. PIPING SHALL ISOLATED FROM INCOMPATIBLE MATERIALS.
27. THREADS ON IRON PIPE SIZE (IPS) PIPE AND FITTINGS SHALL BE STANDARD TAPER PIPE THREADS. THREADS ON TUBING SHALL BE APPROVED TYPES. THREADS ON PLASTIC PIPE SHALL BE FACTORY CUT OR MOLDED. THREADED PLASTIC PIPE SHALL BE SCHEDULE 80
MINIMUM WALL THICKNESS. TUBING THREADS SHALL CONFORM TO FINE TUBING THREAD STANDARDS. WHEN A PIPE JOINT MATERIAL IS USED, IT SHALL BE APPLIED ONLY ON MALE THREADS AND SUCH MATERIALS SHALL BE APPROVED TYPES, INSOLUBLE IN WATER, AND
NONTOXIC. CLEANOUT PLUGS AND CAPS SHALL BE LUBRICATED WITH WATER INSOLUBLE, NON-HARDENING MATERIAL OR TAPE. 27. JOINTS IN COPPER TUBING SHALL BE MADE BY THE APPROPRIATE USE OF APPROVED COPPER OR COPPER ALLOY FITTINGS. SURFACES TO
JOINED BY SOLDERING SHALL BE CLEANED BRIGHT BY MANUAL OR MECHANICAL MEANS. THE JOINTS SHALL BE PROPERLY FLUXED WITH AN APPROVED TYPE FLUX, AND MADE UP WITH APPROVED SOLDER. ALL SOLDER AND FLUXES SHALL BY MANUFACTURED TO APPROVED
STANDARDS. 28. SOLDERS AND FLUXES WITH A LEAD CONTENT WHICH EXCEEDS TWO-TENTHS (0.20) OF ONE (1) PERCENT ARE PROHIBITED IN PIPING
SYSTEMS USED TO CONVEY POTABLE WATER. 29. JOINTS FROM COPPER TUBING TO THREADED PIPE SHALL BE MADE BY THE USE OF BRASS ADAPTER FITTINGS.
30. APPROVED UNIONS MY BE USED IN DRAINAGE WORK WHEN ACCESSIBLY LOCATED IN THE TRAP SEAL OR BETWEEN A FIXTURE AND ITS TRAP; IN THE VENT SYSTEM, EXCEPT UNDERGROUND OR IN WET VENTS; AT ANY POINT IN THE WATER SUPPLY SYSTEM.
31. WHEN CONNECTING PLASTIC PIPE TO OTHER TYPES OF PIPING USE ONLY APPROVED TYPES OF FITTINGS AND ADAPTERS DESIGNED FOR THE SPECIFIC TRANSITION INTENDED.
TRAPS AND INTERCEPTOR NOTES:
1. EACH PLUMBING FIXTURE, EXCEPTING THOSE HAVING INTEGRAL TRAPS, SHALL BE SEPARATELY TRAPPED BY AN APPROVED TYPE WATERSI TRAP. NOT MORE THAN ONE (1) TRAP SHALL BE PERMITTED ON A TRAP ARM. 2. THE VERTICAL DISTANCE BETWEEN A FIXTURE OUTLET AND THE TRAP WEIR SHALL BE AS SHORT AS PRACTICABLE, BUT IN NO CASE SHALL TO SHALL THE PROPERTY OF THE PROPERTY
TAILPIECE FROM ANY FIXTURE EXCEED TWENTY-FOUR (24) INCHES IN LENGTH. 3. EACH PLUMBING FIXTURE TRAP, EXCEPT AS OTHERWISE PROVIDED IN THE UPC, SHALL BE PROTECTED AGAINST SIPHONAGE AND BACK-
PRESSURE, AND AIR CIRCULATION ASSURED THROUGHOUT ALL PARTS OF THE DRAINAGE SYSTEM BY MEANS OF A VENT PIPE. 4. THE VENT PIPE OPENING FROM A SOIL OR WASTE PIPE, EXCEPT FOR WATER CLOSETS AND SIMILAR FIXTURES, SHALL NOT BE BELOW THE
WEIR OF THE TRAP. 5. EACH TRAP SHALL HAVE THE MANUFACTURER'S NAME STAMPED LEGIBLY IN THE METAL OF THE TRAP AND EACH TUBING TRAP SHALL HAVE
THE GAUGE OF THE TUBING IN ADDITION TO THE MANUFACTURER'S NAME. 6. EVERY TRAP SHALL HAVE A SMOOTH AND UNIFORM INTERIOR WATERWAY.
7. THE TRAP SHALL BE THE SAME SIZE AS THE TRAP ARM TO WHICH IT IS CONNECTED.
SUPPLY PIPING NOTES: 1. PROVIDE SHUTOFF VALVES IN ALL DOMESTIC WATER PIPING SYSTEM BRANCHES IN WHICH BRANCH PIPING SERVES TWO OR MORE
FIXTURES. 2. ALL WATER SUPPLY LINES SHALL BE TYPE M COPPER MIN. INSTALLED OVERHEAD (IF INSIDE THE BUILDING), OR TYPE L COPPER IF INSTALLE
BELOW GRADE. 3. ALL WATER LINES (HOT & COLD) SHALL HAVE 3/4" MIN. INSULATION.
4. UNLESS OTHERWISE NOTED, ALL DOMESTIC COLD AND HOT WATER PIPING SHALL BE 1/2" SIZE. 5. ALL STOPS, RISERS, ESCUTCHEON, P-TRAPS, OR OTHER ACCESSORIES TO BE STAINLESS STEEL OR CHROME PLATED.
6. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
7. WHERE DOMESTIC COLD AND HOT WATER PIPING DROPS INTO A PIPE CHASE, THE SIZE SHOWN FOR THE PIPE DROPS SHALL BE USED TO THE LAST FIXTURE.
8. ALL JOINTS AND FITTINGS IN WATER LINES SHALL BE SOLDERED TO MEET CURRENT REGULATIONS. 9. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS (100 FEET OR MORE) TO PERMIT DISASSEMBLY FOR ALTERATION AND REPAIRS.

12. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO

13. PROVIDE CHAINWHEEL OPERATORS FOR ALL VALVES IN EQUIPMENT ROOMS MOUNTED GREATER THAN 7'0" ABOVE FLOOR LEVEL; CHAIN

15. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS

16. ALL VALVES SHALL BE INSTALLED SO THAT VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS

17. PROVIDE FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION

ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AS CLOSE TO THE EQUIPMENT AS POSSIBLE, OR AS INDICATED ON THE DRAWINGS. 18. IN ALL BUILDINGS WHERE POTABLE WATER AND NONPOTABLE WATER SYSTEMS ARE INSTALLED, EACH SYSTEM SHALL BE CLEARLY

NONPOTABLE WATER: YELLOW BACKGROUND WITH BLACK LETTERING, WITH THE WORDS "CAUTION: NONPOTABLE WATER, DO NOT DRINK"

1. RUN ALL WASTE AND VENT PIPING WITH 2% MINIMUM GRADE UNLESS OTHERWISE NOTED. HORIZONTAL VENT PIPING SHALL BE GRADED

2. ELEVATIONS AS SHOWN ON THE DRAWINGS ARE TO THE CENTERLINE OF ALL PRESSURE PIPING, AND TO THE INVERT OF ALL GRAVITY PIPING.

9. PROVIDE CLEANOUTS IN SANITARY AND STORM DRAINAGE SYSTEMS AT ENDS OF RUNS, AT CHANGES IN DIRECTION, NEAR THE BASE OF

10. ALL CLEANOUTS SHALL BE FULL SIZE OF PIPE FOR PIPE SIZES 6 INCHES AND SMALLER, AND SHALL BE 6 INCHES FOR PIPE SIZES LARGER THAN

13. FITTINGS ON SCREWED PIPE SHALL BE OF THE RECESSED DRAINAGE TYPE. BURRED ENDS SHALL BE REAMED TO THE FULL BORE OF THE PIPE.

15. FITTINGS USED FOR DRAINAGE SHALL BE OF THE DRAINAGE TYPE, HAVE A SMOOTH INTERIOR WATERWAY, AND BE CONSTRUCTED SO AS

17. EACH HORIZONTAL DRAINAGE PIPE SHALL BE PROVIDED WITH A CLEANOUT AT ITS UPPER TERMINAL AND EACH RUN OF PIPING, WHICH IS

MORE THAN ONE HUNDRED (100) FEET IN TOTAL DEVELOPED LENGTH, SHALL BE PROVIDED WITH A CLEANOUT FOR EACH ONE HUNDRED (100)

18. EACH PLUMBING FIXTURE TRAP, EXCEPT AS OTHERWISE PROVIDED IN THE UPC, SHALL BE PROTECTED AGAINST SIPHONAGE AND BACK PRESSURE, AND AIR CIRCULATION SHALL BE ASSURED THROUGHOUT ALL PARTS OF THE DRAINAGE SYSTEM BY MEANS OF VENT PIPES. 19. CHANGES IN DIRECTION OF VENT PIPING SHALL BE MADE BY THE APPROPRIATE USE OF APPROVED FITTINGS AND NO SUCH PIPE SHALL BE

20. INDIRECT WASTE PIPES EXCLUDING 5' BUT LESS THAN 15' IN LENGTH SHALL BE DIRECTLY TRAPPED, BUT SHALL NEED NOT BE VENTED.

21. NO MORE THAN 1/3 OF TOTAL PERMITTED VENT LENGTH PER TABLE 7-5 OF CURRENT U.P.C. CAN BE INSTALLED IN HORIZONTAL POSITION

4. ALL DRAIN PIPING, VENT PIPING, AND RELATED FITTINGS TO BE SCHEDULE 40 PVC AND CONFORM TO ASTM D-1785.

7. UNLESS OTHERWISE NOTED, DRAINS SHALL BE INSTALLED AT THE LOW POINT OF ROOTS, AREAWAYS, FLOORS, ETC.

14. THE THREADS OF DRAINAGE FITTINGS SHALL BE TAPPED SO AS TO ALLOW ONE-QUARTER (1/4) INCH PER FOOT GRADE.

16. CLEANOUTS SHALL BE DESIGNED TO BE GAS AND WATERTIGHT WITHOUT THE USE OF ANY GASKET, PACKING, OR WASHER.

5. UNLESS OTHERWISE NOTED, ALL PIPING IS TIGHT TO UNDERSIDE OF SLAB, WITH SPACE FOR INSULATION IF REQUIRED.

	PLUMBING SUPPL	Y LEGEND
		DOMESTIC COLD WATER
		DOMESTIC HOT WATER
		LP GAS
		FIRE SUPPRESSION
	<i></i>	REFRIGERANT R-410
	——— RIBOW DOWN ————————————————————————————————————	TEE OUTLET DOWN
	—O ELBOW UP —O—	TEE OUTLET UP
	WATER HAMMER ARRESTOR	
'		

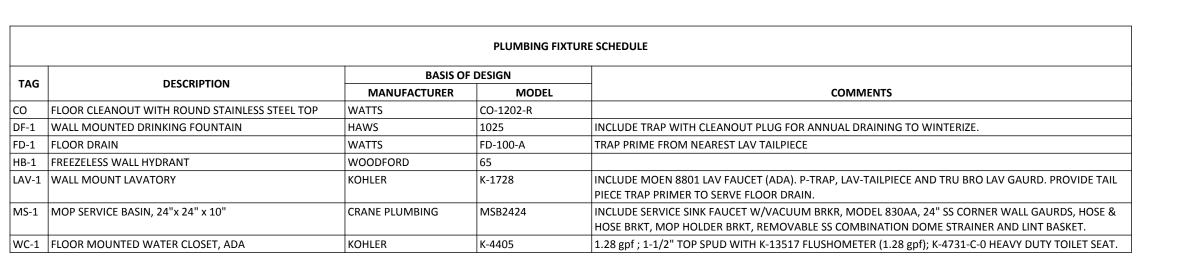
WASTE & VENT LEGEND

---- CONDENSATE PIPING

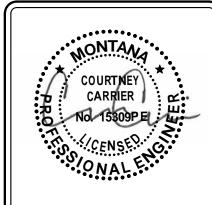
__ - __ - __ - VENT PIPING

SANITARY SEWER

					ELECTRICA	L DATA	
MARK	MANUFACTURER	MODEL	STORAGE CAPACITY	ELEMENT WATTAGE	VOLTAGE	AMPS	WEIGHT (LBS)
DHW-1	RHEEM	MR20230	19.9 gal	3000 WATTS	240 V	13 A	61



2250 HWY 93 SOUTH P.O. BOX 1134
KALISPELL, MT. 59903 PHONE: 406-755-3208 FAX: 406-755-3218 E-MAIL: info@jackola.com WEB PAGE: www.jackola.com
· NONTAN



HOST

SHEET GENERAL PLUMBING symbols, &

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STRAINED OR BENT. BURRED ENDS SHALL BE REAMED TO THE FULL BORE OF THE PIPE.

TRAPS REQUIRING VENTING SHALL EXTEND SEPARATELY TO THE OUTSIDE AIR.

10. ALL VALVES IN THE WATER LINES TO BE BRASS.

SHALL EXTEND TO 7'0" ABOVE FLOOR LEVEL.

EQUIPMENT AND CONTROLS.

11. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.

IDENTIFIED. EACH SYSTEM SHALL BE COLOR CODED AS FOLLOWS:

POTABLE WATER: GREEN BACKGROUND WITH WHITE LETTERING

TO DRIP BACK TO THE SOIL OR WASTE PIPE BY GRAVITY.

12. ALL ROOF PENETRATIONS TO PROTRUDE 16" MIN.

TO ALLOW ONE FOURTH (1/4) INCH PER FOOT GRADE.

FEET, OR FRACTION THEREOF, IN LENGTH OF SUCH PIPING.

14. PROVIDE ALL PLUMBING FIXTURES AND EQUIPMENT WITH ACCESSIBLE STOPS.

3. ADJUST SEWER INVERTS TO KEEP TOPS OF PIPE IN LINE WHERE PIPE SIZE CHANGES.

8. ALL FLOOR DRAINS SHALL HAVE AUTOMATIC TRAP PRIMING DEVICES.

STACKS, EVERY 50 FEET IN HORIZONTAL RUNS, AND ELSEWHERE AS INDICATED.

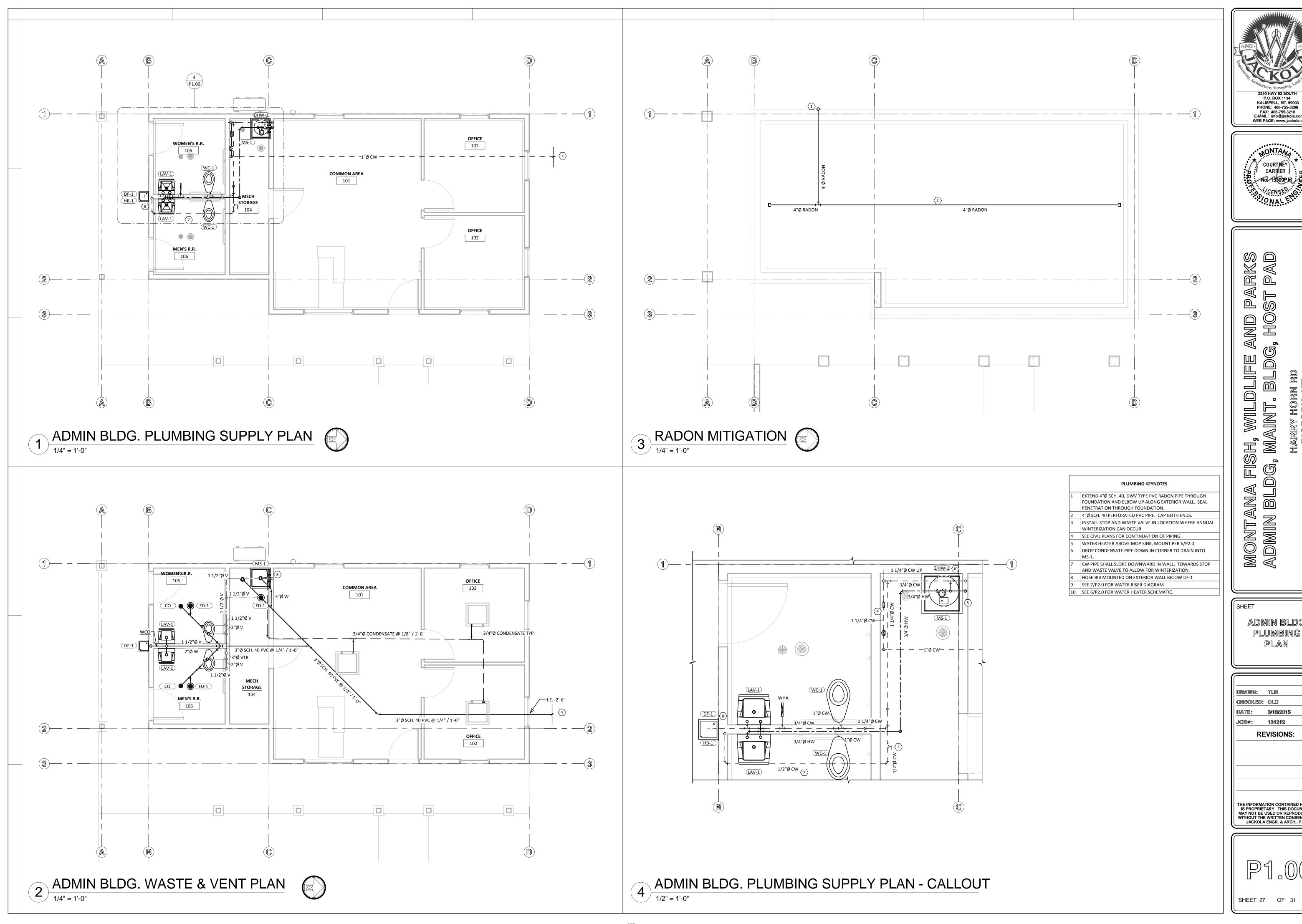
6. ALL FIXTURES TO HAVE P-TRAPS & WATER STOP VALVES OF ADEQUATE SIZE PROVIDED.

11. ALL VTR's AS SPECIFIED ARE MIN. SIZE TO ROOF. ALL ROOF PENETRATIONS TO BE 3" MIN.

GENERAL PLUMBING NOTES

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PARKS ST PAD AND MAINT. BLDG, WILDLIFE FISH, MONTANA ADMIN BLD



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FISH, WILDLIFE AND PARKS JG, MAINT. BLDG, HOST PAD ADMIN

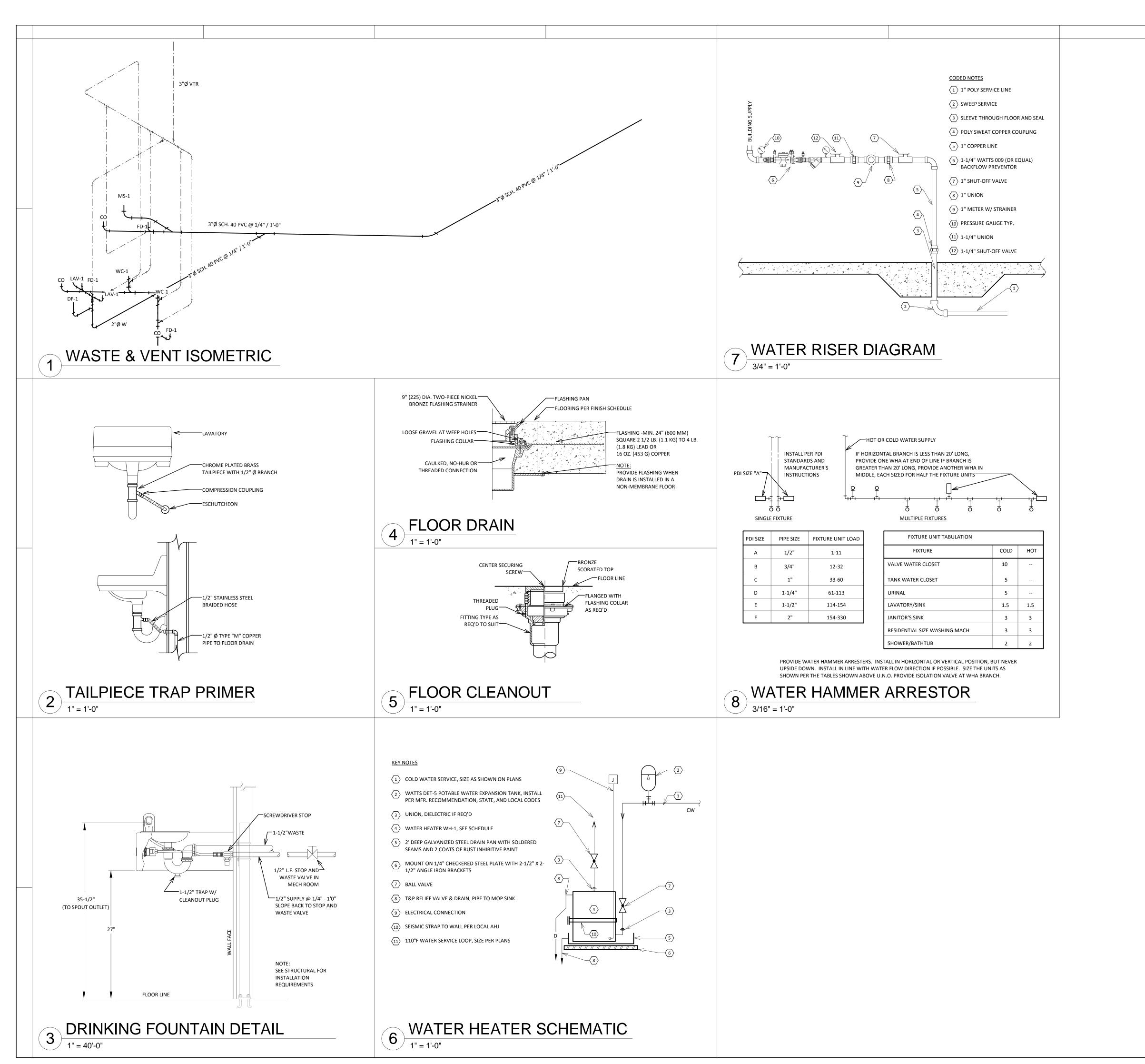
SHEET ADMIN BLDG

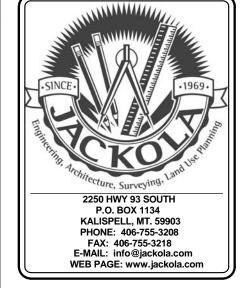
PLAN

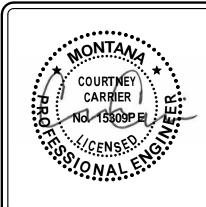
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MONTANA FISH, WILDLIFE AND PARKS ADMIN BLDG, MAINT. BLDG, HOST PAD

PLUMBING
DETAILS

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P2_000
SHEET 28 OF 31

GENERAL ELECTRICAL NOTES. I. GENERAL ELECTRICAL NOTES: ALL SHEETS: 1. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIALS, METHODS, AND WORK MUST BE IN ACCORDANCE AND COMPLIANCE WITH MOST RECENT APPROVED EDITION OF ADAAG, ANSI, IEEE, NEC, NEMA, NFPA, OSHA, TIA, CODES AND STANDARDS. IN ADDITION, ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES, STANDARDS, AND ORDINANCES MUST BE FULLY MET. 2. ALL ELECTRICAL WORK IS TO BE PERFORMED, INSTALLED, TESTED, INSPECTED, AND APPROVED BY QUALIFIED AND LEGALLY LICENSED AND BONDED ELECTRICAL CONTRACTORS/PROFESSIONALS AND THEIR DIRECT REPORTS. WORKING ON ENERGIZED PARTS REQUIRES PROPER EQUIPMENT AND SHALL ONLY BE PERFORMED BY OSHA CERTIFIED EMPLOYEES. 3. ALL FLECTRICAL MATERIAL FOUIPMENT, FIXTURES, AND DEVICES SHALL BE NEW AND ORIGINAL, AND BE LISTED WITH THE UNDERWRITERS LABORATORIES INC., OR EQUAL, AND SHALL MEET THEIR REQUIREMENTS, AND SHALL BEAR THEIR LABEL WHEREVER STANDARDS HAVE BEEN ESTABLISHED AND LABEL SERVICE IS REGULARLY FURNISHED BY THAT AGENCY. ALL ELECTRICAL MATERIAL, EQUIPMENT, FIXTURES, AND DEVICES MUST BE INSTALLED PER THE MANUFACTURERS LISTING AGREEMENT AND IN ACCORDANCE WITH THE INTENDED PURPOSE. ANY SHOP, FIELD OR SITE MODIFICATIONS TO ELECTRICAL MATERIAL, EQUIPMENT, FIXTURES, AND DEVICES, MUST NOT INTERFERE, REMOVE, OR ALTER ITS LISTING, WARRANTY, OR SAFETY AGREEMENTS. 4. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, TOOLS, TEST EQUIPMENT, TRANSPORTATION AND PERFORM ALL OPERATIONS NECESSARY OR INCIDENTAL TO PROPER EXECUTION AND COMPLETION OF ALL "ELECTRICAL WORK" WHETHER SPECIFICALLY MENTIONED OR NOT. 5. GENERAL CONTRACTOR SHALL SECURE AND PAY ALL FEES FOR ALL NECESSARY PERMITS AND UTILITY COMPANY APPLICATIONS. 6. GENERAL CONTRACTOR SHALL PROVIDE ANY TEMPORARY ELECTRICAL POWER AND METER REQUIRED, AND COORDINATE WITH POWER COMPANY/UTILITY TO MEET THEIR REQUIREMENTS FOR SET-UP, UTILIZATION, AND REMOVAL OF TEMPORARY ELECTRICAL POWER AND SHALL COMPLY WITH NEC SEC. 305 AND FOLLOWING GENERAL NOTE 37. 7. ALL COMPLETED ELECTRICAL JOB(S) SHALL BE GUARANTEED BY THE ELECTRICAL CONTRACTOR FOR THE PERIOD OF ONE YEAR AFTER THE DATE OF ACCEPTANCE BY OWNER. ANY WORKMANSHIP PERFORMED BY THE EC FOUND TO BE DEFECTIVE OR FAULTY DURING THAT PERIOD OF TIME SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION AT THE SOLE EXPENSE OF THE EC. 8. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC, RELATED TO ELECTRICAL WORK SHALL BE TURNED OVER TO THE OWNER AT JOB COMPLETION BY EC. ADDITIONALLY, ALL PRODUCT WARRANTY REGISTRATION CARDS, APPLICATIONS, AND CERTIFICATES SHALL BE COMPLETED AND FILLED OUT AND TURNED OVER TO OWNER. ALL SPARE, SURPLUS, AND RELATED ADJUSTMENT PARTS, TOOLS OR DEVICES ARE 9. GENERAL CONTRACTOR SHALL PROVIDE THE OWNER WITH ONE COMPLETE SET OF ELECTRICAL "AS BUILTS" DRAWINGS AT THE COMPLETION OF THE JOB. 10. ELECTRICAL DRAWINGS ARE ESSENTIALLY REPRESENTATIVE IN NATURE, AND DIAGRAMMATIC IN STYLE, SO THAT THE EXACT SIZE AND LOCATION OF EQUIPMENT SHOWN MAY NOT BE TO SCALE, ALL DIMENSIONS AND CONDUIT/CONDUCTOR DATA SHALL BE VERIFIED IN THE FIELD. LOCATIONS AND DIMENSIONS SHALL BE PER ARCHITECTURAL DRAWINGS; ENGINEERING DOCUMENTS (IF ANY) SHALL PREVAIL IN CASE OF VARIATION IN SPECIFICATIONS. DISCREPANCIES MUST BE BROUGHT TO THE ATTENTION OF GC AND OWNER BEFORE START OF WORK. FURNITURE INDICATED ON PLANS IS FOR REFERENCE ONLY. 11. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ELECTRICAL MATERIAL, EQUIPMENT, FIXTURES, AND DEVICE LOCATIONS WITH ALL RELATED ARCHITECTURAL, MECHANICAL, AND STRUCTURAL DRAWINGS TO AVOID AND PREVENT IMPROPER INSTALLATIONS OR WASTEFUL PRACTICES. 12. TYPICAL END USER (CORD CONNECTED) ELECTRICAL EQUIPMENT, SUCH AS BUT NOT LIMITED TO, TELEPHONES, COMPUTER, OFFICE EQUIPMENT, TOOLING, OTHER CORD CONNECTED EQUIPMENT, ETC., SHALL BE PROVIDED BY OTHERS. GENERAL CONTRACTOR SHALL PROVIDE FOR COORDINATION WITH OUTSIDE VENDORS/INSTALLERS REGARDING DELIVERIES, COMMISSIONING, AND TRAINING AS DIRECTED BY OWNER. 13. COMPATIBILITY: ALL ELECTRICAL DEVICES, EQUIPMENT, WIRING, ETC. SHALL BE COMPATIBLE, EACH WITH ONE ANOTHER AND WITH EXISTING WORK AND WITH EXISTING BUILDING STANDARDS. 14. WHEN PART OF ELECTRICAL WORK, EC TO PROVIDE FULL AND COMPLETE SHOP DRAWINGS FOR DATA CABLE, FIRE ALARM SYSTEM, SECURITY ALARM SYSTEM AND LOCATIONS TO ENGINEER FOR FINAL APPROVAL. INCLUDE DIRECTORY AND VERIFY FUNCTIONAL SIGNAL LINK TO AND FROM EXISTING SYSTEM IF ANY. 15. SHOP DRAWINGS AND SUBMITTALS SHALL BE PRODUCED WITH APPLICABLE ELECTRICAL DRAWING SHEET PER DESIGN SPECIFICATION AND ALL APPLICABLE CODES AND STANDARDS AND APPROVED CHANGES OR ADDENDUMS. 16. WHERE 3RD PARTY CONTRACTOR/VENDOR PROVIDES ANY EQUIPMENT OR DEVICE THAT REQUIRES ELECTRICAL ROUGH-IN OR TERMINATION, THAT 3RD PARTY SHALL BE RESPONSIBLE FOR THE COMPLETE COORDINATION OF THESE ISSUES AND PAYMENT FOR THESE REQUIREMENTS. II. & III. ELECTRICAL PANEL/WIRING NOTES 21 TO 40 - E4.1: IV. ELECTRICAL SITE PLAN & NOTES (SEE C1.0): 41. GENERAL CONTRACTOR SHALL PROVIDE ALL TRENCHING, COMPACTION, BACKFILL, WARNING TAPE, CONDUITS AND PULL LINES AS REQUIRED FOR EACH NEW ELECTRICAL SERVICE AND ANY AT EXTERIOR UTILIZATION EQUIPMENT LOCATIONS. 42. EC/GENERAL CONTRACTOR SHALL INSTALL PRIMARY POWER SERVICE CONDUIT(S) DESIGNATED AT A LOCATION DETERMINED BY THE POWER COMPANY AND WITHIN PLAT EASEMENTS. INSTALL CONDUITS W/PULL LINES PER POWER COMPANY STANDARDS. 43. EC/GENERAL CONTRACTOR SHALL INSTALL CONCRETE TRANSFORMER PAD/VAULT(S), PROTECTIVE BOLLARDS, AND PRIMARY/SECONDARY CONDUIT TO INCOMING SERVICE SECTION OF THE MAIN DISTRIBUTION PANEL(S) DESIGNATED AT A LOCATION DETERMINED BY THE RELATED ARCHITECTURAL, SITE, AND STRUCTURAL DRAWINGS ELSEWHERE IN THIS PRINT PACK. INSTALL CONCRETE TRANSFORMER PAD/VAULT(S) PER POWER COMPANY STANDARDS AND SET-BACKS. REFER TO THE RISER DIAGRAM FOR FURTHER INFORMATION. 44. EC/GENERAL CONTRACTOR SHALL PROVIDE ONE 2" TELEPHONE UTILITY SERVICE CONDUIT IN FROM PROPERTY LINE TO NEW SERVICE BOARD LOCATED ELSEWHERE IN THIS PRINT PACK. PROVIDE A 3/4" PLYWOOD BACKER, ONE DEDICATED DUPLEX RECEPTACLE, AND ONE 6 GAGE CU GROUND WIRE ROUTED TO GROUND ROD. COORDINATE COMPLETE INSTALLATION WITH UTILITY AND CONFORM TO ALL TELEPHONE UTILITY STANDARDS 45. WHERE CATV PRESENT, EC/GENERAL CONTRACTOR SHALL PROVIDE ONE 2" CABLE TELEVISION SERVICE CONDUIT IN FROM PROPERTY LINE TO NEW SERVICE BOARD LOCATED ELSEWHERE IN THIS PRINT PACK. PROVIDE A 3/4" PLYWOOD BACKER, ONE DEDICATED DUPLEX RECEPTACLE, AND ONE 10 GAGE CU GROUND WIRE ROUTED TO GROUND ROD. COORDINATE COMPLETE INSTALLATION WITH UTILITY AND CONFORM TO ALL CABLE TELEVISION UTILITY STANDARDS 46. COPPERWELD GROUND RODS SHALL BE 5/8" DIA X8' LONG, SEPARATED BY 6'. RESISTANCE TO GROUND MUST BE 25 OHMS OR LESS (5 OHMS OR LESS RECOMMENDED). CONNECT GROUNDING WIRE DIRECTLY TO GROUND ROD. MINIMIZE CONDUCTOR RIGHT ANGLE BENDS. MAXIMUM LENGTH OF CONDUCTOR SHALL BE 10'. GROUNDING ELECTRODE/JUMPER CONNECTIONS SHALL BE MADE WITH A BOLTED PRESSURE OR COMPRESSION TYPE CONNECTOR SUITABLE FOR DIRECT BURIAL OR EXOTHERMIC WELD. MINIMUM WIRE SIZE PER NEC TABLE 250-66. REFER TO GROUNDING DIAGRAM ELSEWHERE IN THIS PRINT PACK. V. ELECTRICAL COMMUNICATION NOTES (SEE DATA/PHONE MDF DETAIL DRAWING E4.0): 51. COMMUNICATION CIRCUITS SHALL CONFORM TO NEC 800 AND TIA-568A, 569, 607 AND FCC TITLE 47 CFR 68. 52. COMMUNICATION EQUIPMENT SHALL BE UL LISTED TO SECTIONS 444, 497, 1459, AND 1863. 53. PERFORMANCE OF NETWORKS SHALL CONFORM TO ANSI/IEEE STD. 802.3 (.5 FOR TOKEN RING APPS.). VI. ELECTRICAL SUBMITTAL NOTES (WHERE APPLICABLE/PER CONTRACT): A. INCLUDE SHOP DRAWING, EQUIPMENT/PART INFORMATION, APPLICATION NOTES, WARRANTY INFORMATION 1) SWITCHGEAR, PANELBOARDS, DISCONNECTS, OVERCURRENT DEVICES WITH SCHEDULE, AND TVSS 2) LIGHTS BY TYPE AND FINISH, INSTALLATION, TRIM, AIMING, BALLAST, BULB, AND CONTROL VOLTAGE 3) ALARM SYSTEMS (FIRE, SECURITY, CCTV) 4) LIGHT CONTROL SYSTEM BY CONTRACTOR SIZE, CONTROL AND OVERRIDE 5) RELATED/REQUIRED DIVISION 15, MECHANICAL, SYSTEM- DISCONNECTS AND STARTERS. 6) RELATED/REQUIRED DIVISION 2, SITE UTILITY EQUIPMENT AND CONTROL, SEPTIC, AND WATER WELL, SYSTEM 8) INCLUDE ANY INTENDED CHANGES BEING SUBMITTED FOR APPROVAL TO SPECIFIED BUILDING STANDARD ELECTRICAL DEVICES, MATERIALS, OR UTILIZATION EQUIPMENT. *** NOTE: ALL ELECTRICAL SUBMITTALS SHALL BE PROVIDED TO ENGINEERING FOR APPROVAL. AFTER G.C. APPROVES SUBSTITUTION REQUIRES 10 DAY ADVANCE NOTICE. VII. ELECTRICAL TEST(S) NOTES: A. CLOSEOUT SUBMITTALS: PROCEDURES FOR CLOSEOUT SUBMITTALS. 1. PROJECT RECORD DOCUMENTS: ACCURATELY RECORD THE FOLLOWING. A. LOCATIONS OF ELECTRICAL COMPONENTS AND GROUNDING ELECTRODES B. COMPLIANCE WITH I. GENERAL ELECTRICAL NOTES 5.6.7.8. & 9 (ABOVE). B. TESTING AND INSPECTION: 1. INSPECT AND TEST IN ACCORDANCE WITH NETA ATS, EXCEPT SECTION 4. 2. PERFORM INSPECTIONS AND TESTS LISTED IN NETA ATS, SECTION 7.13. 3. FIELD QUALITY CONTROL - ELECTRICAL TESTING AND INSPECTION C. REGULATORY REQUIREMENTS: 1. SAFETY PRACTICES: INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING REQUIREMENTS: A. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 - OSHA. B. ACCIDENT PREVENTION MANUAL FOR INDUSTRIAL OPERATIONS, SEVENTH EDITION, NATIONAL SAFETY COUNCIL, CHAP. 4. C. APPLICABLE STATE AND LOCAL SAFETY OPERATING PROCEDURES. D. NETA SAFETY/ACCIDENT PREVENTION PROGRAM. F. NFPA 70E - ELECTRICAL SAFETY REQUIREMENTS FOR EMPLOYEE WORKPLACE. G. AMERICAN NATIONAL STANDARDS FOR PERSONNEL PROTECTION, ANSI Z244.1. 2. PERFORM TESTS WITH APPARATUS DE-ENERGIZED EXCEPT WHERE OTHERWISE SPECIFICALLY REQUIRED HEREIN. 3. POWER CIRCUITS: CONDUCTORS SHORTED TO GROUND BY A HOT LINE GROUNDED DEVICE APPROVED FOR THE PURPOSE. D. TESTS AND INSPECTIONS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING: 1. PROPER OPERATION OF LIGHTS, SWITCHES, RECEPTACLES, AND SPECIFIED EQUIPMENT 2. CONTINUITY OF RACEWAY SYSTEM. 3. INSULATION LEAKAGE AND IMPEADANCES 4. GROUND SYSTEM RESISTANCE. 5. ELIMINATION OF REVERSE ROTATION AND SINGLE-PHASING OF MOTORS. 6. SUB-SYSTEM TESTS INDICATED IN OTHER DIVISIONS (HVAC, SEPTIC, LIFE SAFETY) SYSTEMS AS SPECIFIED. 7. PROPER OPERATION OF FIRE DETECTION SYSTEMS SPECIFIED IN DIVISION 16.

VIII. GENERAL SYMBOL NOTES (REF E4.0):

& MECHANICAL ROOM ARE STAINLESS STEEL

1. ALL SWITCHES AND RECEPTACLES ARE AS SPECIFIED OR APPROVED "COMMERCIAL" GRADE EQUAL.

3. ALARM, COMPUTER, HVAC, LIGHTS, AND UTILITY RECEPTACLES EACH REQUIRE SEPARATE WIRING HOME RUN U.O.N.

6. ALL TOGGLE SWITCHES ARE TO BE FLUSH MOUNTED AT 42" A.F.F., U.O.N., TO BOTTOM AND BE PROVIDED WITH A THERMOPLASTIC COVER PLATE TO

THERMOPLASTIC COVER PLATE TO MATCH THE DEVICE UNLESS OTHERWISE SPECIFIED. COLOR OF DEVICE TO BE IVORY/IVORY EXCEPT KITCHEN, BATHROOMS,

10. EC TO PROVIDE, PER CONTRACT, ROUGH-IN TO CEILING FREE SPACE OR COMMUNICATION NETWORK LOCATION AND INSTALL 1/2" CONDUIT, MUD RING,

AND JUNCTION BOX FOR COMBINATION DATA/TELEPHONE OUTLETS, FIRE & ALARM OUTLETS. METAL RACEWAY AND BOXES FOR FIRE ALARM CIRCUITS.

MATCH DEVICE UNLESS OTHERWISE SPECIFIED. COLOR OF DEVICE TO BE IVORY/IVORY EXCEPT KITCHEN, BATHROOMS, & MECHANICAL ROOM ARE

8. ALL RECEPTACLES, COAX, DATA, TELEPHONE, ETC. ARE TO BE FLUSH MOUNTED AT 12" A.F.F., U.O.N., TO BOTTOM AND BE PROVIDED WITH A

2. SWITCHES AND INSTALLATION OF SAME, SHALL FULLY COMPLY WITH NEC ARTICLE 230.

7. RECEPTACLES AND INSTALLATION OF SAME, SHALL FULLY COMPLY WITH NEC ARTICLE 210.

11. PHONE/DATA/CATV FACE PLATE, WIRING TERMINATIONS, AND TESTING BY OTHERS.

* EACH DEVICE OR OTHERS PER "LEVITON" (1-800-323-8920) CATALOG D-5023 OR EQUAL.

12. ALL SWITCHES AND RECEPTACLES SHALL BE UL LISTED AND OF AN APPROVED NEMA CONFIGURATION.

13. AUDIO SYSTEM & SECURITY TYPICAL ROUGH-IN WIRES AND AUDIO EQUIPMENT BY OTHERS. (CONDUIT STUB BY EC).

5. DO NOT MIX NEUTRALS BETWEEN PHASES FOR SINGLE PHASE CIRCUITS U.O.N.

9. ALL BACK-TO-BACK DEVICES TO BE OFFSET HORIZONTALLY 6" MINIMUM.

ELECTRICAL LEGEND

UTILITY METER

UTILITY POLE

TRANSFORMER

GROUND ROD

LOW VOLTAGE

GROUND

RELAY SWITCH

MOTOR

D PUMP

TIME CLOCK

NORMALLY OPEN

PUMPS/MOTORS

→ NORMALLY CLOSED CONTACT

VARIABLE SPEED PUMP

PUMP CONTROL PANEL

EQUIPMENT DISCONNECT

DISCONNECT

DISCONNECT

(T) THERMOSTAT

PHONE/DATA

☐ FUSE WITH DISCONNECT

TELEPHONE OUTLET

TELEPHONE OUTLET

MICROPHONE JACK

▲ TELEPHONE PORT

DATA PORT

T/P TELE-POWER POLE

──⊗ EXIT SIGN OUTLET

DATA/PHONE PORT

DATA/PHONE PORT FLOOR

MOUNTED DATA/PHONE JUNCTION BOX

TELEPHONE TERMINAL BOARD

FIRE ALARM SYSTEM

EMERGENCY BATTERY BACKED

EMERGENCY BATTERY BACKED

ADA HORN/STROBE PROVIDE CODE

APPROVED FIRE, SMOKE ALARM

THREE HEAD LIGHT

SYSTEM COMPLETE

— DUCT SMOKE DET. AS NECESSARY

SMOKE DETECTOR PHOTO

SMOKE DETECTOR ION

MAGNETIC DOOR HOLD

FIRE ALARM PULL STATION

END OF LINE DEVICE

PHOTO/ION COMBO

EMERGENCY LIGHT

HEAT DETECTOR 135 RR IN

EXIT SIGN WITH DUAL HEAD

□ DUCT SMOKE DETECTOR

MECH. ROOM SMOKE DETECTOR

SMOKE DETECTOR

DUAL HEAD LIGHT

▲ WALL MOUNTED TELEPHONE OUTLET

INSTRUMENT WALL MOUNTED DATA OUTLET

☐⊢ FUSE

MAGNETIC MOTOR STARTER

MAGNETIC MOTOR STARTER WITH

COMBINATION FLOOR MOUNTED

ELECTRICAL/DATA/TELEPHONE OUTLET

WALL MOUNTED COMBINATION DATA/

WALL MOUNTED COMBINATION DATA/

WALL MOUNTED TELEPHONE OUTLET @

54" AFF WITH WALL HUNG TELEPHONE

20A, 3 POLE, DUEL ELEMENT FUSE WITH

AUTOMATIC TRANSFER SWITCH

LIGHTING

FLUORESCENT STRIP

RECESSED FLUORESCENT LIGHT

RECESSED CAN LIGHT

PENDANT LIGHT

(o) BOLLARD LIGHT

W WALLPACK

EXHAUST FAN

PHOTOCELL

OUTLETS

- WALL MOUNTED SCONCE

SURFACE-MOUNT FLUORESCENT LIGHT

RECESSED FLUORESCENT LIGHT

RECESSED EMERGENCY CAN LIGHT

POLE-MOUNTED LIGHT, SINGLE HEAD

POLE-MOUNTED LIGHT, DOUBLE HEAD

EXIT LIGHT W/ DIRECTIONAL ARROW

EXHAUST FAN WITH LIGHT FIXTURE

WALL MOUNTED DUPLEX OUTLET

WALL MOUNTED TRIPLEX OUTLET

WALL MOUNTED QUAD OUTLET

WALL MOUNTED DUPLEX OUTLET

WALL MOUNTED SINGLE OUTLET

WALL MOUNTED DUPLEX OUTLET

FLOOR MOUNTED DUPLEX OUTLET

GROUND FAULT INTERRUPTER

SINGLE SPECIAL PURPOSE

DOUBLE SPECIAL PURPOSE

SWITCH IN CRAWL SPACE

DOUBLE POLE SWITCH

\$ SINGLE POLE SWITCH

TWO CIRCUT SWITCH

THREE CIRCUT SWITCH

KEY OPERATED SWITCH

MOTION CONTROLLED SWITCH

SWITCH WITH TIMER

DIMMER SWITCH

DEHUMIDITY SWITCH

SWITCH WITH FUSE

SECURITY/INTERCOM

DOOR BELL, LOCATE BELL @ 7'-0" AFF

PUSH BUTTON FOR ELECTRIC DOOR

RECESSED DOOR CONTACT

PUSH BUTTON STATION W/ SPEAKER

DPIS DOOR POSITION INDICATOR SWITCH

→+ WALL OUTLET FOR CCTV CAMERA

STRIKE RELEASE

EMERGENCY PANEL

SPEAKER, 7.5 WATT

PUSH BUTTON STATION

VOLUME CONTROL

MICROPHONE

ELECTRIC LATCH

(OS) OCCUPANCY SENSOR

CABLE TELEVISION PORT

P P POWER PACK

KEYPAD

DIGITAL LIGHTING SWITCH

\$ SMALL MOTOR DISCONNECT SWITCH

\$ 3-WAY SWITCH

\$ 4-WAY SWITCH

□ PULL STATION

REC OUTLET

SWITCHES

WEATHER PROOF PROVIDE WEATHER PROOF

POWER OUTLETS TO OUTSIDE OF BUILDING

WALL MOUNTED DUPLEX OUTLET WITH

WITH ISOLATED GROUND

WITH SEPARATE CIRCUIT

WITH SEPARATE CIRCUIT

WALL MOUNTED GFI DUPLEX OUTLET

₩ WALL-MOUNT EMERGENCY FLOODLIGHT

PER 250-80 O O O GROUNDO O O TO STRUCTURE -BOND TO NEW MAIN SWITCH BOARDS SERVICE GROUND BUS. & MAIN SWITCH BOARDS CHASSIS PER NEC 250-24(b), 28, 142, * CIRCUITING TO DATA/TELEPHONE PER NEC 800-40, EIA/TIA 607 JUNCTION BOX TO TRANSFORMER PER AND BY UTILITY O O O NEUTRAL O O O ELECTRICAL DISTRIBUTION PANEL PER NEC 250-30(a)(1) (#4 CU) TO GROUND BUS PER NEC 250-96(b), 146(d) * HOMERUN TO PANEL A, ARROWHEADS A-1 INDICATE # OF CIRCUITS. HASH MARKS TO EACH NEW LOADCENTER, PANELBOARD, OR DISCONNECT PER NEC 250-80 & 384-20. * INDICATE # OF CONDUCTORS HOT & COLD COPPER PLUMBING WITHIN 60" OF BUILDING TO CONCRETE ENCASED REBAR |= NEUTRAL; |= HOT; ⊤= ISOLATED ENTRY PER NEC 250-50. (20' MIN. OF 1/2" MIN.) PER NEC GROUNDING ELECTRODE CONDUCTOR (GEC) PER NEC TABLE 250-66. EQUIPMENT GROUNDING CONDUCTOR (EGC) PER NEC TABLE 250-122. BOND TO ANY SEPARATELY CONDUIT TURNED DERIVED SOURCE PER NEC 250-30. FULL FULL SIZED GEC OR EGC PER NEC TABLES 250-66, 122. DOWN UNDERGROUND CONDUIT BOND TO ANY LIGHTNING (#6 CU) SPECIFIC WIRE SIZE: AWG, CONTINUOUS CU GREEN, THHN. TERMINALS PER NEC ---- CONDUIT HIDDEN IN 250-106. MUST COMPLY WITH NEC ARTICLES 250-52c3 AND 250-56, MADE - DRIVEN ROD ELECTRODE AT LEAST 8' BELOW GRADE UNTIL FLUSH WITH GRADE AT LEAST 24" AWAY FROM BUILDING. VERIFY UNDERGROUND CLEARANCES PRIOR TO DRIVING

PROVIDE 2 EA (MIN.) 8' ROD 5/8" DIAMETER COPPER WELD, 25 Ohm OR LESS (5 Ohm TARGET), PROVIDE 12x4x1/4 Cu CONTINUOUS ISOLATED NEUTRAL & BONDED GROUND BUS IN MAIN ENCLOSURE PROVIDE ALL GROUNDING AND BONDING CONNECTORS AND ACCESSORIES BY ILSCO, OR EQUAL. PROVIDE ALL GROUND RODS BY THOMAS AND BETTS, OR EQUAL. PROVIDE LIGHTNING PROTECTION AS REQUIRED, LIGHTNING PROTECTION EQUIPMENT HARGER, OR EQUAL. GROUNDING PERFORMANCE CRITERIA:

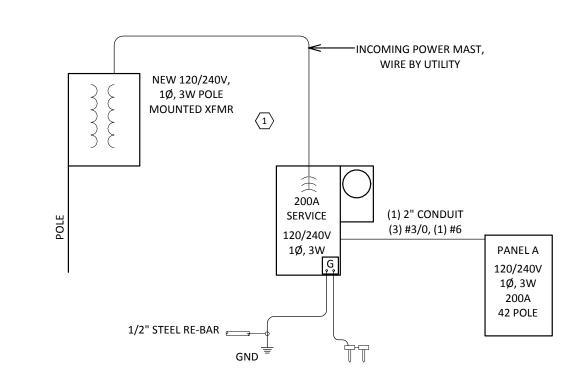
RODS VERTICALLY UNDERGROUND.

ELECTRICAL GROUNDING SYSTEM

1. INSTALL ROD ELECTRODES WHERE SHOWN AND ANY ADDITIONAL REQUIRED TO ACHIEVE SPECIFIED RESISTANCE TO GROUND. PROVIDE SEPARATE EQUIPMENT GROUNDING CONDUCTOR (INSULATED) WITHIN EACH FEEDER AND BRANCH CIRCUIT. 2. SUPPLEMENT THE GROUNDED NEUTRAL OF THE SECONDARY DISTRIBUTION SYSTEM WITH AN EFFECTIVE EQUIPMENT GROUNDING SYSTEM TO ADEQUATELY AND PROPERLY SAFEGUARD ALL ELECTRICAL EQUIPMENT AND PERSONNEL. INSTALL EACH EQUIPMENT GROUNDING SUCH THAT ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS, JUNCTION BOXES, OUTLET BOXES, CABINS, PULL BOXES, AND CONDUCTIVE FRAMES, ENCLOSURES, OR OTHER CONDUCTIVE PARTS IN CLOSE PROXIMITY WITH ELECTRICAL POWERED CIRCUITS OPERATE CONTINUOUSLY AT GROUND (ZERO) POTENTIAL (VOLTS) AND PROVIDE A CONTINUOUS LOW IMPEDANCE PATH FOR POSSIBLE GROUND FAULT CURRENTS AND SURGE VOLTAGES.

3. PROVIDE ALL GROUNDING AND BONDING OF ELECTRICAL SERVICE, CIRCUITS, EQUIPMENT, COMMUNICATIONS SYSTEMS, AND SIGNAL SYSTEMS AS REQUIRED BY THE NEC, LOCAL CODES AND ORDINANCES, AND THE POWER & PHONE COMPANIES, AND THESE CONTRACT DOCUMENTS. INSTALL, BOND, AND TEST GROUND ELECTRODE SYSTEM TOGETHER PER NEC ARTICLES 110, 200, 250 AND 280. NFPA 780-1997. * = 200% SIZED WHERE >50% NONLINEAR LOADS PRESENT.

ELECTRICAL RISER DIAGRAM



(1) COORDINATE NEW SERVICE ENTRANCE AND METERING REQUIREMENTS WITH THE LOCAL UTILITY COMPANY. METERING EQUIPMENT SHALL BE SUBMITTED TO LOCAL UTILITY COMPANY FOR SIGNATURE APPROVAL AND THEN TO ELECTRICAL ENGINEER OF RECORD FOR APPROVAL

 $\langle 2 \rangle$ ALL CIRCUIT WIRE SHALL BE COPPER WIRE RHW OR THWN IN DRY OR WET LOCATIONS AND THWN ONLY IN DRY LOCATIONS

GENERAL LIGHTING

CRITERIA:

. LIGHT FIXTURES & LUMINARIES VOLTAGE SHALL MATCH

2. TYPICAL EMERGENCY AND EXIT LIGHTS SHALL BE WIRED TO

3. LIGHTING LOCATIONS & AIMING SHALL BE COORDINATED

WHEN COORDINATING REFLECTED CEILING PLANS, TYPICAL

LIGHTING LOCATIONS SHALL TAKE PRECEDENCE OVER HVAC DIFFUSER, SPEAKERS, AND SPRINKLER HEADS, U.O.N., REPORT

6. CONTRACTOR SHALL VERIFY EACH J-BOX HAS SUFFICIENT

ATTACHMENT ANCHORAGE TO SUPPORT LIGHTING OR FAN

8. NIGHT LIGHTS ARE DESIGNATED WITH "HATCH" & ARE

7. EXIT SIGNS SHALL BE FURNISHED WITH NUMBER OF FACES

9. CONTRACTOR SHALL VERIFY ALL BULBS, COLORS, LENGTHS,

TRIMS, CEILING TYPES, MOUNTINGS, FINISHES, ETC., WITH THE

ORDER, INCLUDING THE INTENT OF ALL APPROVED REVISIONS OR

ARCHITECT, PRIOR TO PLACING FINAL LIGHTING PURCHASE

AND DIRECTIONAL ARROWS AS REQUIRED TO SUIT PLAN AND THE

ANY DISCREPANCY.

WEIGHT LOADS.

LOCAL AUTHORITY.

CONTROLLED AT PANEL (24-HOUR).

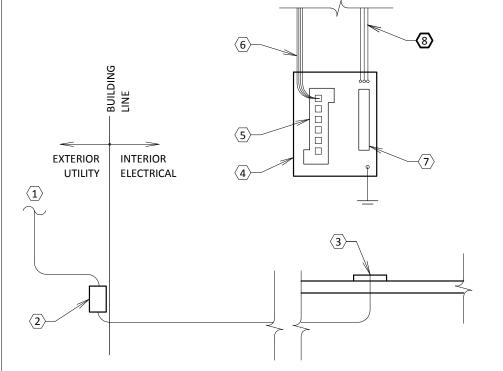
PUBLISHED ADDENDUMS.

WITH THE ARCHITECT'S REFLECTED CEILING PLAN & ELEVATIONS.

NEAREST ROOM LIGHTING CIRCUIT AHEAD OF ANY CONTROLS OR

SERVICE AND CIRCUIT VOLTAGE AVAILABLE & ASSIGNED.

PHONE/DATA/CATV RISER DIAGRAM



(1) OVERHEAD TLEPHONE BY UTILITY

2 EXTERIOR NID TERMINATION BOX BY UTILITY.

3 PHONE DROP IN 1-1/2" CONDUIT TO PUNCHDOWN IN MECHANICAL ROOM

(4) 24"X24" PLYWOOD PUNCHDOWN FOR PHONE/DATA WITH GROUNDING BLOCK, #6 AWG

(5) 12 PORT 110 STYLE WALL MOUNT PATCH PANEL OWNER

6 DATA CABLES BY OWNER

(7) 110 STYLE PHONE BLOCK BY EC, PHONE/FIBER CONNECTION BY UTILITY.

(8) INCOMING PHONE CABLES/OUTGOING PHONE CABLES BY E.C.

PA	NEL: A 120/240, 1PH	200AMP							25,300 VA; 105	Α
NO.	DESCRIPTION	ОСР	(VA)	(A)	PH	(A)	(VA)	ОСР	DESCRIPTION	NO.
1	LIGHTS - OFFICE 102 / 103	20A-1P	140	1.16	Α	8.0	950	25A-2P	HP-1, CC-1, CC-2, CC-3	2
3	LIGHTS - COMMON / MECH	20A-1P	188	1.56	В	8.0	950	"	11	4
5	LIGHTS - EXTERIOR WALL	20A-1P	96	.8	Α	6.25	1500	15A-2P	BASEBOARDS - OFFICES	6
7	LIGHTS - BOLLARD / POLE	20A-1P	381	3.2	В	V	V	V	V	8
9	OUTLETS - OFFICE 102	20A-1P	720	6	Α	13.5	2500	20A-2P	BASEBOARDS - COMMON / MECH	10
11	OUTLETS - OFFICE 103	20A-1P	720	6	В	V	V	V	V	12
13	OUTLETS - COMMON	20A-1P	1260	10.5	Α	12.5	1500	20A-1P	EF-1	14
15	OUTLETS - MECH	20A-1P	360	3	В	12.5	1500	20A-1P	EF-2	16
17	OUTLETS - EXTERIOR	20A-1P	360	3	Α	.20	24	15A-1P	EF-3; EF-4	18
19	SPACE				В	15	1750	20A-2P	DUPLEX PUMP 1	20
21	WATER HEATER	20A-2P	3000	12.5	Α	V	₩		V	22
23	V	∀	V	\ \V	В	15	3600	20A-2P	DUPLEX PUMP 2	24
25					Α	V	₩		V	26
27					В	10	1200	15A-1P	DUPLEX PUMP CONTROL PANEL	28
29										30
31										32
33										34
35										36
37										38
39										40
41										42

ELECTRIC BASEBOARD SCHEDULE										
TAG	DESCRIPTION	MANUFACTURER	MODEL	WATTAGE	ELECTRICAL DATA	NOTES				
BB-1	ELECTRIC BASEBOARD HEATER	CADET	3F750*	750	240/1/60	1				
BB-2	ELECTRIC BASEBOARD HEATER	CADET	6F1500*	1500	240/1/60	1				
BB-3	ELECTRIC BASEBOARD HEATER	CADET	4F1000*	1000	240/1/60	1				

1. INCLUDE THERMOSTAT ON BASEBOARD

	LIGHTING FIXTURE SCHEDULE									
TAG	DESCRIPTION	LAMPS PER FIXTURE	WATTS PER LAMP	LUMEN PACKAGE	VOLTAGE	MANUFACTURER	MODEL OR P/N	NOTES		
B-1	LED BOLLARD	1	31 W	12C 700 40K	120 V	ACUITY BRANDS LIGHTING	DSXB LED 12C 100 40K ASY MVOLT DDBXD	SEE C1.11 FOR LOCATION		
EX-1	EXIT SIGN WITH EMERGENCY EGRESS LIGHTS	1	4 W	RED LED	120 V	ACUITY BRANDS LIGHTING	LHQM LED R			
L-1	4' SURFACE MOUNT VOLUMETRIC LED	1	35 W	40L LP840	120 V	ACUITY BRANDS LIGHTING	STL4 40L LP840			
L-2	LOW-PROFILE LED STRIPLIGHT 48"	1	42 W	5000LM	120 V	ACUITY BRANDS LIGHTING	ZL1N L48 5000LM FST MVOLT 40K 80CRI WH			
L-3	GENERAL PURPOSE STRIP 4FT LONG WITH TWO LAMPS	2	32 W	32	120 V	ACUITY BRANDS LIGHTING	C 2 32 MVOLT GEB10IS			
P-1	POLE MOUNTED LED AREA LIGHT	1	131 W	60C 700 40K	120 V	ACUITY BRANDS LIGHTING	DSX1 LED 60C 700 40K T4M MVOLT MA DDBXD	SEE C1.11 FOR LOCATION		
WP-1	WST LED WITH 1 MODULE 10 LEDs 700mA DRIVER 4000K COLOR TEMPERATURE TYPE 4 LENS	1	24 W	10A700/40K SR4	120 V	ACUITY BRANDS LIGHTING	WST LED 1 10A700/40K SR4 MVOLD DDBXD			
WP-2	WST LED WITH 1 MODULE 10 LEDs 700mA DRIVER 4000K COLOR TEMPERATURE TYPE 4 LENS OPERATING IN EMERGENCY MODE	1	24 W	10A700/40K SR4	120 V	ACUITY BRANDS LIGHTING	WST LED 1 10A700/40K SR4 MVOLT ELCW DDBXD	INCLUDE EMERGENCY BATTERY BACKUP		
WP-3	WSTM LED WITH 1 MODULE 4000K COLOR TEMPERATURE	1	9 W	1A 40K	120 V	ACUITY BRANDS LIGHTING	WSTM LED 1A 40K 120 DDBXD			
WP-4	OUTDOOR LED AREA LIGHT WITH ALUMINUM HOUSING AND POLYCARBONATE LENS	1	21 W	1 40K	120 V	ACUITY BRANDS LIGHTING	TDD LED 1 40K 120 PE			

2250 HWY 93 SOUTH KALISPELL, MT. 59903 PHONE: 406-755-3208



AINT

GENERAL

ADMIN

MONT,

| DRAWN: TLH CHECKED: TAJ DATE: 3/18/2015 JOB#: 131212 **REVISIONS:**

> THE INFORMATION CONTAINED HEREIN IS PROPRIETARY. THIS DOCUMENT MAY NOT BE USED OR REPRODUCED JACKOLA ENGR. & ARCH., P.C

SHEET 29 OF 31

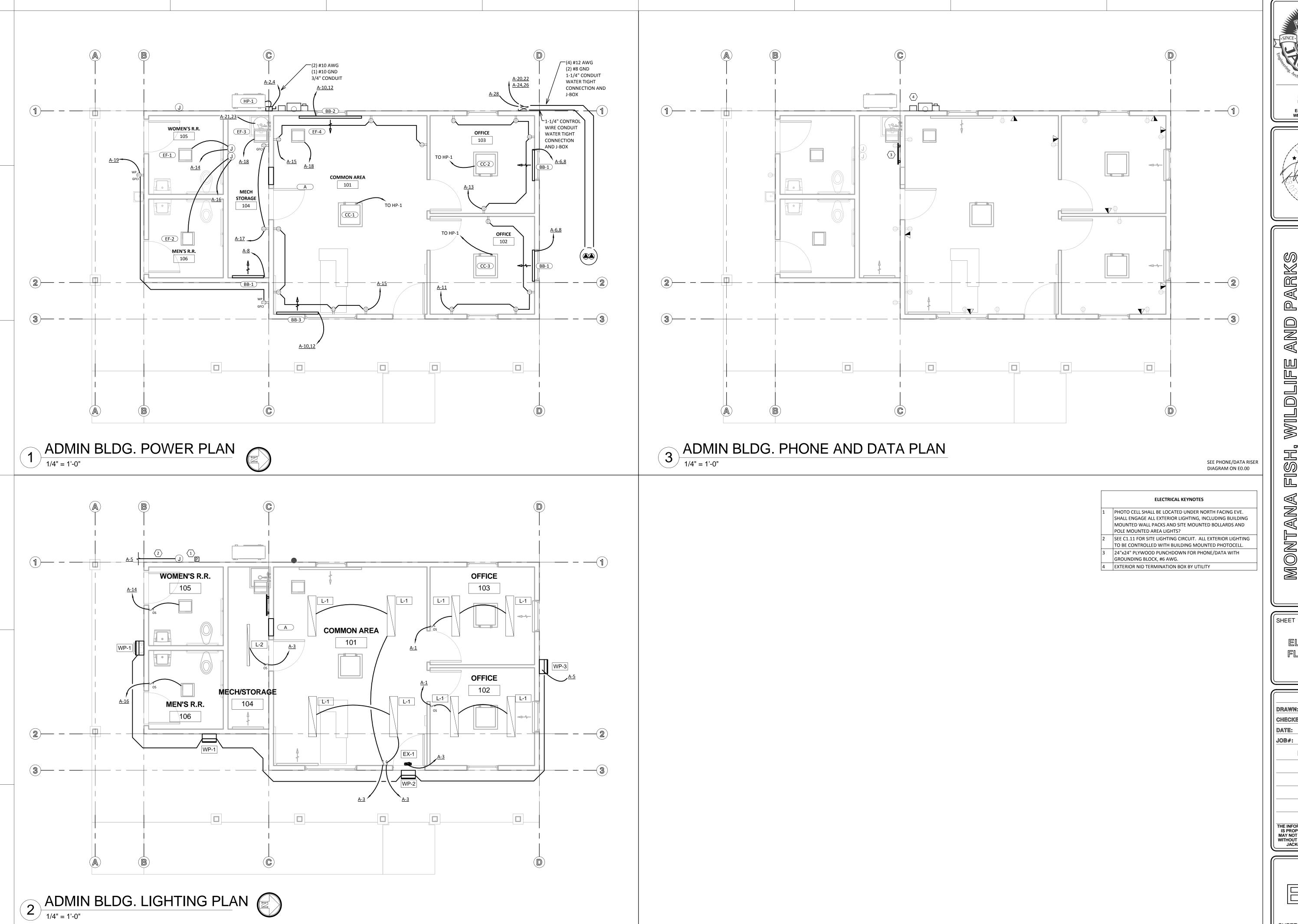
FAX: 406-755-3218 WEB PAGE: www.jackola.com

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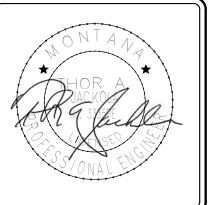
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SYMBOLS





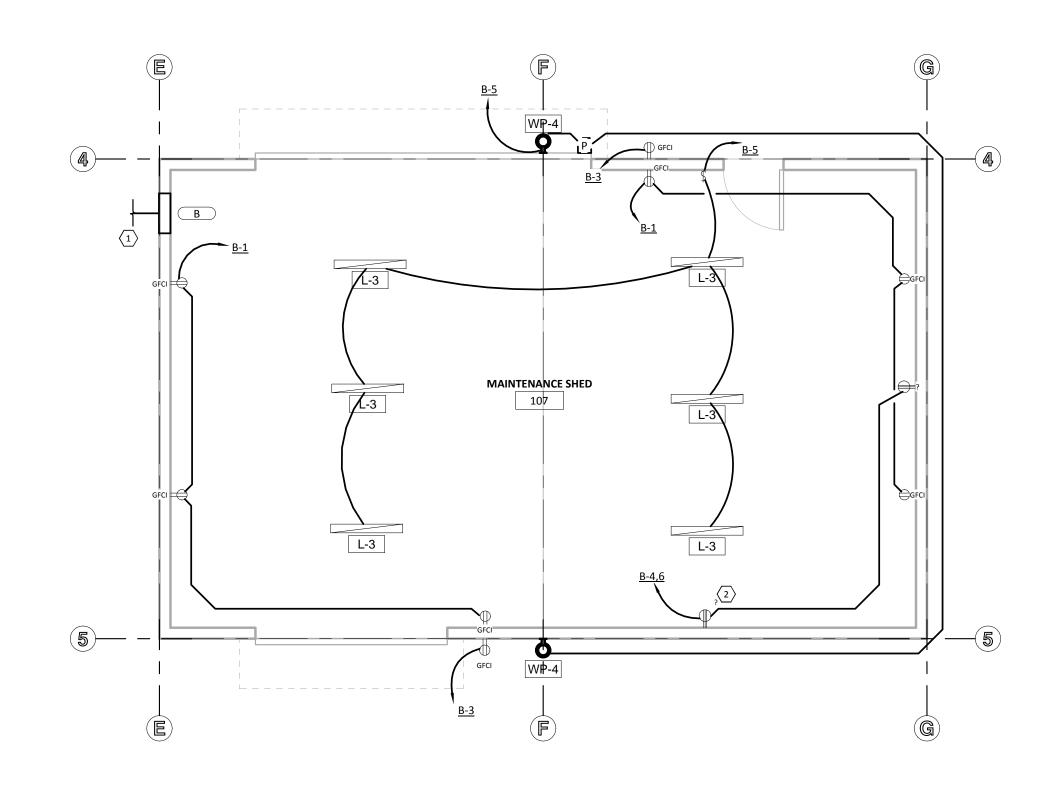


FISH, WILDLIFE AND PARKS G, MAINT. BLDG, HOST PAD MONTANA [

ELECTRICAL FLOOR PLAN

DRAWN: TLH CHECKED: TAJ DATE: 3/18/2015 JOB#: 131212 **REVISIONS:** THE INFORMATION CONTAINED HEREIN IS PROPRIETARY. THIS DOCUMENT MAY NOT BE USED OR REPRODUCED WITHOUT THE WRITTEN CONSENT OF JACKOLA ENGR. & ARCH., P.C.

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MAINT. BLDG ELECTRICAL PLAN

1/4" = 1'-0"

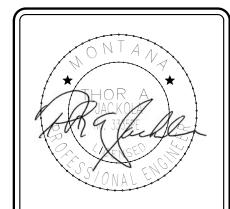
LIGHTING FIXTURE SCHEDULE.									
TAG	DESCRIPTION	LAMPS PER FIXTURE	WATTS PER LAMP	LUMEN PACKAGE	VOLTAGE	MANUFACTURER	MODEL OR P/N	NOTES	
L-3	GENERAL PURPOSE STRIP 4FT LONG WITH TWO LAMPS	2	32 W	32	120 V	ACUITY BRANDS LIGHTING	C 2 32 MVOLT GEB10IS		
WP-4	OUTDOOR LED AREA LIGHT WITH ALUMINUM HOUSING AND POLYCARBONATE LENS	1	21 W	1 40K	120 V	ACUITY BRANDS LIGHTING	TDD LED 1 40K 120 PE		

PANEL: B 120/240, 1PH EXISTING										
NO.	NO. DESCRIPTION		(VA)	(A)	PH	(A)	(VA)	ОСР	DESCRIPTION	NO.
1	OUTLETS - MAINT SHED INDOOR W/S	20A-1P	540	1.16		4.5	540	20A-1P	OUTLETS - MAINT SHED INDOOR E/N	2
3	OUTLETS - MAINT SHED OUTDOOR	20A-1P	360	3		24	5760	30A-2P	OUTLETS - 240 VAC	4
5	LIGHTS - MAINT SHED INTERIOR / EXTERIOR	20A-1P	480	4		V	\bigvee	V	V	6

ELECTRICAL KEYNOTES MAINT. SHED

EXISTING CONDUIT, CONDUCTORS, AND PANEL SALVAGE FOR RE-USE

2 240 VAC RECEPTACLE AND CIRCUIT. MAXIMUM RATING OF 30A



2250 HWY 93 SOUTH
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MONTANA FISH, WILDLIFE AND PARKS ADMIN BLDG, MAINT. BLDG, HOST PAD

SHEET

MAINT. BLDG ELECTRIC FLOOR PLAN -ADD ALT. 2

DRAWN: TLH CHECKED: TAJ DATE: 3/18/2015

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